Access DB# 86780

# SEARCH REQUEST FORM

**Scientific and Technical Information Center**

Requester's Full Name: GREGG CANTELMO Examiner #: 75777 Date: 2/13/03
Art Unit: 1745 Phone Number 30 5 0635 Serial Number: 10/068,398
Mail Box and Bldg/Room Location: CP3 8E09 Results Format Preferred (circle): PAPER DISK ~~E-MAIL~~

**If more than one search is submitted, please prioritize searches in order of need.**

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Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: SEE ATTACHED

Inventors (please provide full names): SEE ATTACHED

Earliest Priority Filing Date: 7/19/2000

***For Sequence Searches Only*** *Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.*

Alloy A and B

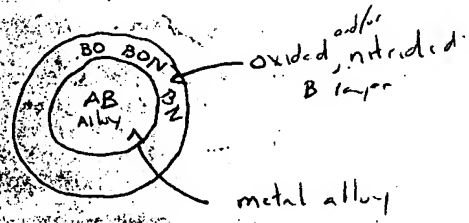
PHASE A METAL → Sn, Si, Al, Ga, In, Pb, Sb, Bi
(in dependent claim + spec)

PHASE B METAL → Ti, Zr or any rare earth element

Alloy is in a nonaqueous electrolyte battery and alloy is for the negative electrode (anode)

PHASE A METAL CAN BE 0% (oxygen and/or nitrogen)

EXAMPLES

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| STAFF USE ONLY | Type of Search | Vendors and cost where applicable |
|---|---|---|
| Searcher: EA | NA Sequence (#) | STN $290.10 |
| Searcher Phone #: | AA Sequence (#) | Dialog |
| Searcher Location: | Structure (#) ✓ (3) | Questel/Orbit |
| Date Searcher Picked Up: | Bibliographic ✓ (and) | Dr.Link |
| Date Completed: 2-14-03 | Litigation | Lexis/Nexis |
| Searcher Prep & Review Time: 10 | Fulltext | Sequence Systems |
| ~~Clerical Prep Time:~~ | Patent Family | WWW/Internet |
| Online Time: 105 | Other | Other (specify) |

PTO-1590 (8-01)

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=> file reg
FILE 'REGISTRY' ENTERED AT 10:31:00 ON 14 FEB 2003
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     FILE 'HCAPLUS' ENTERED AT 09:09:32 ON 14 FEB 2003
L1       103087 SEA SATO ?/AU
L2          676 SEA BITO ?/AU
L3         9699 SEA OKAMURA ?/AU
L4            2 SEA L1 AND L2 AND L3
                SEL L4 1 RN

     FILE 'REGISTRY' ENTERED AT 09:16:35 ON 14 FEB 2003
L5           28 SEA (12014-73-2/BI OR 12039-41-7/BI OR 12039-70-2/BI OR

     FILE 'HCAPLUS' ENTERED AT 09:21:04 ON 14 FEB 2003
L6       184488 SEA BATTERY OR BATTERIES OR (ELECTROCHEM? OR ELECTROLY?
                OR GALVANI? OR WET OR DRY OR PRIMARY OR SECONDARY)(2A)(CE
                LL OR CELLS)
L7        53379 SEA NONAQ# OR NONAQUEOUS? OR NONWATER? OR NONH2O OR
                ANHYDROUS? OR NON(A)(AQ# OR AQUEOUS? OR WATER? OR H2O)
L8              QUE LITHIUM# OR LITHIAT? OR LI
L9              QUE ANOD## OR (NEGATIV? OR NEG)(2A)ELECTROD##

     FILE 'REGISTRY' ENTERED AT 09:23:06 ON 14 FEB 2003
                E OXYGEN/CN
L10           1 SEA OXYGEN/CN
                E NITROGEN/CN
L11           1 SEA NITROGEN/CN

     FILE 'LREGISTRY' ENTERED AT 09:23:54 ON 14 FEB 2003
L12         498 SEA (SN OR SI OR AL OR GA OR IN OR PB OR SB OR BI)/ELS
                (L) ((TI OR ZR)/ELS OR (LNTH OR ACTN)/PG)
L13          78 SEA L12 AND 2/ELC.SUB
L14           0 SEA L12 AND N/ELS AND 3/ELC.SUB
L15          31 SEA L12 AND O/ELS AND 3/ELC.SUB

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L16        4629 SEA L12 AND 2/ELC.SUB

     FILE 'HCAPLUS' ENTERED AT 09:35:33 ON 14 FEB 2003
L17             QUE L10 OR OXYGENA? OR OXIDN# OR OXIDA? OR OXIDI? OR O2
                OR (OXYGEN# OR O)(2A)(ATM# OR ATMOS? OR GAS## OR
                GASEOUS? OR GASIF? OR INTRODUC? OR APPLY? OR APPLIED OR
                APPLICATION? OR INJECT? OR JET OR JETS OR SYRING? OR
                NEEDL? OR STREAM? OR NOZZL? OR PORT OR PORTS OR PORTAL?)
L18             QUE L11 OR NITROGENA? OR NITRIDED OR NITRIDING# OR N2 OR
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                (NITROGEN# OR N)(2A)(ATM# OR ATMOS? OR GAS## OR GASEOUS?
                OR GASIF? OR INTRODUC? OR APPLY? OR APPLIED OR APPLICATIO
                N? OR INJECT? OR JET OR JETS OR SYRING? OR NEEDL? OR
                STREAM? OR NOZZL? OR PORT OR PORTS OR PORTAL?)
L19         24484 SEA L16
L20           131 SEA L19 AND L6
L21            33 SEA L20 AND L7
L22            59 SEA L20 AND L8
L23            74 SEA L20 AND L9
L24            30 SEA L21 AND L22
L25            31 SEA L21 AND L23
L26            51 SEA L22 AND L23
L27            28 SEA L21 AND L22 AND L23
L28         35674 SEA INTERCAL? OR INTER(2A)CALAT?
L29            15 SEA L20 AND L28
L30             3 SEA L27 AND L17
L31             3 SEA L27 AND L18
L32            15 SEA L20 AND L17
L33             6 SEA L20 AND L18

     FILE 'REGISTRY' ENTERED AT 09:50:21 ON 14 FEB 2003
L34        212463 SEA (SN OR SI OR AL OR GA OR IN OR PB OR SB OR BI)/ELS
                  (L) ((TI OR ZR)/ELS OR (LNTH OR ACTN)/PG)
L35           600 SEA L34 AND N/ELS AND 3/ELC.SUB
L36          2159 SEA L34 AND O/ELS AND 3/ELC.SUB

     FILE 'HCAPLUS' ENTERED AT 09:52:32 ON 14 FEB 2003
L37          2219 SEA L35
L38         23135 SEA L36
L39             4 SEA L37 AND L6
L40           187 SEA L38 AND L6
L41             7 SEA L40 AND L28
L42            12 SEA L40 AND L7
L43            27 SEA L40 AND L8
L44            79 SEA L40 AND L9
L45            16 SEA L43 AND L44
L46            19 SEA L30 OR L31 OR L33 OR L39 OR L41
L47            36 SEA (L29 OR L32 OR L42 OR L45) NOT L46
L48            14 SEA L27 NOT (L46 OR L47)

     FILE 'REGISTRY' ENTERED AT 10:31:00 ON 14 FEB 2003

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=> d l46 1-19 cbib abs hitstr hitind

L46  ANSWER 1 OF 19  HCAPLUS  COPYRIGHT 2003 ACS
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2002:604601 Document No. 138:26787 Metal Oxide Composites for Lithium-Ion **Battery** Anodes Synthesized by the Partial Reduction Process. Limthongkul, Pimpa; Wang, Haifeng; Jud, Eva; Chiang, Yet-Ming (Department of Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA, 02139, USA). Journal of the Electrochemical Society, 149(9), A1237-A1245 (English) 2002. CODEN: JESOAN. ISSN: 0013-4651. Publisher: Electrochemical Society.

AB A thermochem. process based on the partial redn. of mixed oxides is used to create ultrafine metal-ceramic composites for Li-ion **battery** electrodes. Mixed oxides contg. a more noble metal selected to be capable of alloying with Li at potentials useful as a Li-ion **battery** anode are partially reduced to form electrochem. active metal-ceramic composites. Expts. show the differences in microstructure obtained in systems with slow oxygen diffusion (SbVO4, AgVO3, and Ag2V4O11), fast oxygen diffusion (Sb2Mn2O7 distorted fluorite), and microphase sepn. (Sn0.5Ti0.5O2 rutile). Materials are characterized using x-ray diffraction, SEM, TEM, and scanning TEM; electrochem. tests are also presented. Reversible charge capacities of 200-350 mA-h/g (1100-2200 mA-h/cm3) were obtained.

IT **52014-36-5**, Tin titanium oxide (SnTiO4)
(phase sepd., undoped or doped; metal oxide composites for lithium-ion **battery** anodes synthesized by partial redn.)

RN 52014-36-5 HCAPLUS

CN Tin titanium oxide (SnTiO4) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 4 | 17778-80-2 |
| Ti | 1 | 7440-32-6 |
| Sn | 1 | 7440-31-5 |

IT **52014-36-5D**, Tin titanate (SnTiO4), partially-reduced
(undoped and doped; metal oxide composites for lithium-ion **battery** anodes synthesized by partial redn.)

RN 52014-36-5 HCAPLUS

CN Tin titanium oxide (SnTiO4) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 4 | 17778-80-2 |
| Ti | 1 | 7440-32-6 |
| Sn | 1 | 7440-31-5 |

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56, 57

ST metal oxide nanocomposite partial redn lithium ion **battery** anode

IT **Battery** anodes
Ceramic composites
**Intercalation**
Metal matrix composites
(metal oxide composites for lithium-ion **battery** anodes synthesized by partial redn.)

IT 12026-36-7D, Silver vanadium oxide (Ag2V4O11), partially-reduced
12311-81-8D, Antimony vanadium oxide (SbVO4), partially-reduced
13497-94-4D, Silver vanadium oxide (AgVO3), partially-reduced
39055-71-5D, Antimony manganese oxide (Sb2Mn2O7), partially-reduced
(metal oxide composites for lithium-ion **battery** anodes synthesized by partial redn.)

IT **52014-36-5**, Tin titanium oxide (SnTiO4)
(phase sepd., undoped or doped; metal oxide composites for lithium-ion **battery** anodes synthesized by partial redn.)

IT 7429-90-5, Aluminum, uses 7440-25-7, Tantalum, uses
(phase-sepd. or partially-reduced tin titanate doped with; metal oxide composites for lithium-ion **battery** anodes synthesized by partial redn.)

IT **52014-36-5D**, Tin titanate (SnTiO4), partially-reduced
(undoped and doped; metal oxide composites for lithium-ion **battery** anodes synthesized by partial redn.)

L46 ANSWER 2 OF 19 HCAPLUS COPYRIGHT 2003 ACS
2002:391433 Document No. 136:372308 Preparation of **anode** material for **nonaqueous** electrolyte secondary **battery**. Sato, Toshitada; Nakamoto, Takayuki; Shimamura, Harunari; Okamura, Kazuhiro (Matsushita Electric Industrial Co., Ltd., Japan). Eur. Pat. Appl. EP 1207577 A2 20020522, 15 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR. (English). CODEN: EPXXDW. APPLICATION: EP 2001-127022 20011114. PRIORITY: JP 2000-348790 20001115; JP 2001-187848 20010621.

AB A method for producing a **neg**. **electrode** material for a **non-aq**. electrolyte secondary **battery** is disclosed: which includes a step of applying a shearing force to an intermetallic compd. under the presence of nitrogen. The intermetallic compd. contains element (A) which reacts with nitrogen and forms a nitride, but does not react with **lithium**, and element (B) which does not react with nitrogen, but reacts with **lithium**, thereby forming a mixt. contg. a nitride of element (A) and a substance of element (B). The at least one element (A) can be selected from the group A consisting of Ce, Co, Cr, Fe, La, Mn, Mo, Nb, P, Sc, Sr, Ta, Ti, V, Y, Yb, Zr, B, Ca, Mg, Na and Zn, and the at least one element (B) can be selected from the group B consisting of Ge, Sn, Pb, Sb and Bi.

IT **7727-37-9**, **Nitrogen**, uses
(**gas atmosphere**; prepn. of **anode** material for **nonaq**. electrolyte secondary **battery**)

RN 7727-37-9 HCAPLUS

CN Nitrogen (8CI, 9CI) (CA INDEX NAME)



IT **12166-63-1 12510-35-9**, SnTi2 **56626-54-1 318515-48-9**
(prepn. of **anode** material for **nonaq.** electrolyte secondary **battery**)
RN 12166-63-1 HCAPLUS
CN Tin, compd. with titanium (5:6) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Ti | 6 | 7440-32-6 |
| Sn | 5 | 7440-31-5 |

RN 12510-35-9 HCAPLUS
CN Tin, compd. with titanium (1:2) (8CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Ti | 2 | 7440-32-6 |
| Sn | 1 | 7440-31-5 |

RN 56626-54-1 HCAPLUS
CN Bismuth, compd. with cerium (1:2) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Bi | 1 | 7440-69-9 |
| Ce | 2 | 7440-45-1 |

RN 318515-48-9 HCAPLUS
CN Tin, compd. with zirconium (1:2) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Zr | 2 | 7440-67-7 |
| Sn | 1 | 7440-31-5 |

IC ICM H01M004-58
ICS H01M004-38
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56
ST **anode** material **nonaq** electrolyte secondary

**battery**
IT Styrene-butadiene rubber, uses
(binder; prepn. of **anode** material for **nonaq.** electrolyte secondary **battery**)
IT **Battery anodes**
Mechanochemical reaction
**Nitriding**
Secondary **batteries**
(prepn. of **anode** material for **nonaq.** electrolyte secondary **battery**)
IT Intermetallic compounds
(prepn. of **anode** material for **nonaq.** electrolyte secondary **battery**)
IT 7440-37-1, Argon, uses
(gas atmosphere; prepn. of **anode** material for **nonaq.** electrolyte secondary **battery**)
IT **7727-37-9, Nitrogen**, uses
(**gas atmosphere**; prepn. of **anode** material for **nonaq.** electrolyte secondary **battery**)
IT 12032-53-0 12059-56-2 **12166-63-1 12510-35-9**, SnTi2 25617-97-4, Gallium nitride gan **56626-54-1** 130811-82-4, Cobalt **lithium** manganese oxide Co0.2LiMn1.8O4 **318515-48-9** 424830-90-0
(prepn. of **anode** material for **nonaq.** electrolyte secondary **battery**)
IT 7782-42-5, Graphite, uses
(prepn. of **anode** material for **nonaq.** electrolyte secondary **battery**)
IT 9003-55-8
(styrene-butadiene rubber, binder; prepn. of **anode** material for **nonaq.** electrolyte secondary **battery**)

L46 ANSWER 3 OF 19 HCAPLUS COPYRIGHT 2003 ACS
2002:72468 Document No. 136:121128 Secondary **nonaqueous** electrolyte **battery**. Sato, Toshitada; Bito, Yasuhiko; Okamura, Kazuhiro; Nitta, Yoshiaki (Matsushita Electric Industrial Co., Ltd., Japan). PCT Int. Appl. WO 2002007239 A1 20020124, 34 pp. DESIGNATED STATES: W: CN, KR, US; RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR. (Japanese). CODEN: PIXXD2. APPLICATION: WO 2001-JP6189 20010717. PRIORITY: JP 2000-218528 20000719.
AB The **battery** has a **Li** intercalating cathode, a **Li** salt **nonaq.** electrolyte soln., and a **Li** intercalating **anode**, composed of a powd. alloy contg. .gtoreq.2 metal and metalloid elements and .gtoreq.1 of N and O; where the alloy has a **Li** intercalating phase contg. .ltoreq.0.5% O and N and a **Li** non-intercalating phase contg. .gtoreq.1.0% O and N.
IT **12039-41-7 12039-70-2**, Titanium silicide (TiSi) **12039-83-7**, Titanium silicide (TiSi2) **12166-63-1**

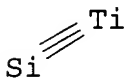
Priority Docs 4/8 Instant cpp

**12440-44-7**, PbTi4 **12510-35-9 70495-28-2**
**390417-62-6**
(compns. and structure of powd. multiphase oxygen and nitrogen contg. **lithium** intercalating alloys for secondary **lithium battery anodes**)

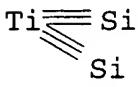
RN 12039-41-7 HCAPLUS
CN Antimony, compd. with zirconium (2:1) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Zr | 1 | 7440-67-7 |
| Sb | 2 | 7440-36-0 |

RN 12039-70-2 HCAPLUS
CN Titanium silicide (TiSi) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)




RN 12039-83-7 HCAPLUS
CN Titanium silicide (TiSi2) (6CI, 8CI, 9CI) (CA INDEX NAME)




RN 12166-63-1 HCAPLUS
CN Tin, compd. with titanium (5:6) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Ti | 6 | 7440-32-6 |
| Sn | 5 | 7440-31-5 |

RN 12440-44-7 HCAPLUS
CN Lead, compd. with titanium (1:4) (8CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Ti | 4 | 7440-32-6 |
| Pb | 1 | 7439-92-1 |

RN 12510-35-9 HCAPLUS

CN Tin, compd. with titanium (1:2) (8CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Ti | 2 | 7440-32-6 |
| Sn | 1 | 7440-31-5 |

RN 70495-28-2 HCAPLUS
CN Antimony, compd. with zirconium (1:1) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Zr | 1 | 7440-67-7 |
| Sb | 1 | 7440-36-0 |

RN 390417-62-6 HCAPLUS
CN Lead, compd. with titanium (1:1) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Ti | 1 | 7440-32-6 |
| Pb | 1 | 7439-92-1 |

IT **7727-37-9**, Nitrogen, uses **7782-44-7**, Oxygen, uses
(compns. and structure of powd. multiphase oxygen and nitrogen contg. **lithium** intercalating alloys for secondary **lithium battery anodes**)
RN 7727-37-9 HCAPLUS
CN Nitrogen (8CI, 9CI) (CA INDEX NAME)

RN 7782-44-7 HCAPLUS
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

IC ICM H01M004-38
ICS H01M004-02; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST secondary **lithium battery anode** alloy compn; multiphase alloy nitrogen oxygen **battery anode**
IT **Battery anodes**
(compns. and structure of powd. multiphase oxygen and nitrogen

contg. **lithium** intercalating alloys for secondary **lithium battery anodes**)

IT 7704-34-9, Sulfur, uses 7723-14-0, Phosphorus, uses 7789-24-4, **Lithium** fluoride, uses
(additives in powd. multiphase oxygen and nitrogen contg. **lithium** intercalating alloys for secondary **lithium battery anodes**)

IT 7439-92-1, Lead, uses 7440-21-3, Silicon, uses 7440-31-5, Tin, uses 7440-36-0, Antimony, uses 7440-55-3, Gallium, uses 7440-69-9, Bismuth, uses 7440-74-6, Indium, uses 12014-73-2, CeNi **12039-41-7 12039-70-2**, Titanium silicide (TiSi) **12039-83-7**, Titanium silicide (TiSi2) 12052-50-5 12142-63-1, LaNi 12158-68-8 **12166-63-1 12440-44-7**, PbTi4 **12510-35-9 70495-28-2** 390417-59-1 390417-60-4 390417-61-5 **390417-62-6** 390417-63-7
(compns. and structure of powd. multiphase oxygen and nitrogen contg. **lithium** intercalating alloys for secondary **lithium battery anodes**)

IT **7727-37-9**, Nitrogen, uses **7782-44-7**, Oxygen, uses
(compns. and structure of powd. multiphase oxygen and nitrogen contg. **lithium** intercalating alloys for secondary **lithium battery anodes**)

L46 ANSWER 4 OF 19 HCAPLUS COPYRIGHT 2003 ACS

2001:778282 Document No. 135:306304 **Anode** active mass for secondary **nonaqueous** electrolyte **batteries**, manufacture of the **anode** active mass, and the **batteries**. Nitta, Yoshiaki; Shimamura, Harushige; Kohiyori, Motoharu; Asabe, Kazutaka; Takeshita, Yukiteru; Negi, Noriyuki; Yamamoto, Hiroyoshi (Sumitomo Metal Industries Ltd., Japan; Matsushita Electric Industrial Co., Ltd.). Jpn. Kokai Tokkyo Koho JP 2001297766 A2 20011026, 9 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-113911 20000414.

AB The **anode** active mass is a powd. alloy having a 1st phase, contg. .gtoreq.1 elements capable of reversibly assocg. and dissocg. with **Li**, and a 2nd phase contg. an intermetallic compd. of the element in the 1st phase; where the alloy powder has an O content .ltoreq.1000 mass ppm. The **anode** active mass is prepd. by atomizing melted alloy, where the alloy is melted in an atm. contg. .ltoreq.1000 vol. ppm O at a temp. below T+500.degree.C (T = liquidus line temp. of the alloy), the gas for the atomization is an inert gas contg. 1-10 vol.% H, and the solidified alloy powder is deposited at .ltoreq.500.degree..

IT **212574-89-5P**
(compns. and manuf. of powd. low oxygen multiphase **lithium** alloying alloys for secondary **lithium battery anodes**)

RN 212574-89-5 HCAPLUS

CN Silicon alloy, base, Si 61,Ti 39 (9CI) (CA INDEX NAME)

Component Component Component

| | Percent | Registry Number |
|---|---|---|
| Si | 61 | 7440-21-3 |
| Ti | 39 | 7440-32-6 |

IT **7782-44-7**, Oxygen, miscellaneous
(compns. and manuf. of powd. low oxygen multiphase **lithium** alloying alloys for secondary **lithium battery anodes**)
RN 7782-44-7 HCAPLUS
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O═O

IC ICM H01M004-58
ICS H01M004-02; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST secondary **lithium battery** alloying **anode** compn manuf
IT **Battery anodes**
(compns. and manuf. of powd. low oxygen multiphase **lithium** alloying alloys for secondary **lithium battery anodes**)
IT 1333-74-0, Hydrogen, uses 7440-37-1, Argon, uses
(atomizing gas for manuf. of powd. low oxygen multiphase **lithium** alloying alloys for secondary **lithium battery anodes**)
IT 169217-08-7P **212574-89-5P** 367266-45-3P
(compns. and manuf. of powd. low oxygen multiphase **lithium** alloying alloys for secondary **lithium battery anodes**)
IT 7439-93-2, **Lithium**, miscellaneous **7782-44-7**, Oxygen, miscellaneous
(compns. and manuf. of powd. low oxygen multiphase **lithium** alloying alloys for secondary **lithium battery anodes**)

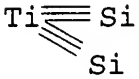
L46 ANSWER 5 OF 19 HCAPLUS COPYRIGHT 2003 ACS
2001:760452 Document No. 135:320485 Manufacture of alloy powder by gas atomization for **anode** of secondary **nonaqueous** -electrolyte **lithium battery**. Kohiyori, Motoji; Asabe, Kazutaka; Takeshita, Yukiteru; Negi, Noriyuki; Yamamoto, Hiroyoshi; Nitta, Yoshiaki; Shimamura, Harushige; Okamura, Kazuhiro (Sumitomo Metal Industries Ltd., Japan; Matsushita Electric Industrial Co., Ltd.). Jpn. Kokai Tokkyo Koho JP 2001291513 A2 20011019, 9 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-104832 20000406.
AB An alloy melt is gas-atomized for manufg. **anode** alloy powder contg. .gtoreq.1 **Li**-intercalatable metal element phase and intermetallic compd. phase contg. .gtoreq.1 of the metal

element, where the gas atomization process is carried out under the following conditions: (1) the temp. of the melt is .ltoreq.(liquidus temp. of the alloy + 500.degree.); (2) spraying gas is selected from Ar, He, and/or **N2**; (3) the flow rate of the spraying gas at the position, where the flowing alloy melt meets with the spraying gas at first, is Mach .gtoreq.1 to the speed of sound of the gas at 293K and 1.013 .times. 105 Pa. In the obtained alloy powder, particle size D (.mu.m) of .gtoreq.80 vol.% of the powder satisfies the following equation: D .ltoreq. [(2.5a + 10b + 3.8c) .times. 102]1/1.5 (a, b, and c are vol. ratio of Ar, He, and **N2**, resp., in the spraying gas; a + b + c = 1). The alloy powder has high charge/discharge capacity and long cycle life.

IT **12039-83-7P**, Titanium silicide (TiSi2)
(intermetallic compd. phase; manuf. of **anode** alloy powder contg. intermetallic compd. phase by gas atomization for **nonaq**.-electrolyte **Li battery** with high discharge capacity)

RN 12039-83-7 HCAPLUS

CN Titanium silicide (TiSi2) (6CI, 8CI, 9CI) (CA INDEX NAME)



IT **212574-89-5P**
(manuf. of **anode** alloy powder contg. intermetallic compd. phase by gas atomization for **nonaq**.-electrolyte **Li battery** with high discharge capacity)

RN 212574-89-5 HCAPLUS

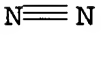
CN Silicon alloy, base, Si 61,Ti 39 (9CI) (CA INDEX NAME)

| Component | Component Percent | Component Registry Number |
|---|---|---|
| Si | 61 | 7440-21-3 |
| Ti | 39 | 7440-32-6 |

IT **7727-37-9**, **Nitrogen**, uses
(spraying **gas**; manuf. of **anode** alloy powder contg. intermetallic compd. phase by gas atomization for **nonaq**.-electrolyte **Li battery** with high discharge capacity)

RN 7727-37-9 HCAPLUS

CN Nitrogen (8CI, 9CI) (CA INDEX NAME)

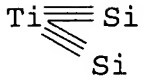


IC ICM H01M004-38

ICS B22F001-00; B22F009-08; C22C001-04; H01M004-02
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56
ST gas atomization **anode** alloy powder **nonaq** electrolyte **lithium battery**; intermetallic compd phase **anode** alloy powder gas atomization **battery** ; discharge capacity gas atomization **anode** alloy powder **lithium battery**
IT **Battery anodes**
Powders
(manuf. of **anode** alloy powder contg. intermetallic compd. phase by gas atomization for **nonaq**.-electrolyte **Li battery** with high discharge capacity)
IT Atomizing (spraying)
(pneumatic; manuf. of **anode** alloy powder contg. intermetallic compd. phase by gas atomization for **nonaq** .-electrolyte **Li battery** with high discharge capacity)
IT 12017-12-8P, Cobalt silicide (CoSi2) 12035-57-3P, NiSi **12039-83-7P**, Titanium silicide (TiSi2) 12201-89-7P, Nickel silicide (NiSi2)
(intermetallic compd. phase; manuf. of **anode** alloy powder contg. intermetallic compd. phase by gas atomization for **nonaq**.-electrolyte **Li battery** with high discharge capacity)
IT 169217-08-7P **212574-89-5P** 217196-37-7P 367266-45-3P
(manuf. of **anode** alloy powder contg. intermetallic compd. phase by gas atomization for **nonaq**.-electrolyte **Li battery** with high discharge capacity)
IT 7440-37-1, Argon, uses 7440-59-7, Helium, uses **7727-37-9** , **Nitrogen**, uses
(spraying **gas**; manuf. of **anode** alloy powder contg. intermetallic compd. phase by gas atomization for **nonaq**.-electrolyte **Li battery** with high discharge capacity)

L46 ANSWER 6 OF 19 HCAPLUS COPYRIGHT 2003 ACS
2001:673661 Document No. 135:244983 **Anode** materials for secondary **nonaqueous** electrolyte **batteries**.
Uenaka, Hideya; Negi, Noriyuki; Takeshita, Yukiteru; Kohiyori, Motoji; Yonemura, Koji; Nitta, Yoshiaki; Shimamura, Harushige (Sumitomo Metal Industries Ltd., Japan; Matsushita Electric Industrial Co., Ltd.). Jpn. Kokai Tokkyo Koho JP 2001250540 A2 20010914, 8 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-59855 20000306.
AB The **anode** materials comprise alloy powders contg. phases of elements (a) which reversibly form compds. with and dissoc. from **Li** and phases of intermetallic compds. contg. the elements (a). The thicknesses of surface **oxidized** layers of the alloy powders are .ltoreq.5 nm. The materials provide secondary **nonaq**. electrolyte **batteries** with high discharge capacity and long cycle life.

IT **12039-83-7**, Titanium silicide (TiSi2) **359860-38-1**
(intermetallic phase-contg. Si alloy **anodes** for secondary **nonaq**. electrolyte **Li batteries**)
RN 12039-83-7 HCAPLUS
CN Titanium silicide (TiSi2) (6CI, 8CI, 9CI) (CA INDEX NAME)



RN 359860-38-1 HCAPLUS
CN Silicon alloy, base, Si 60,Ti 40 (9CI) (CA INDEX NAME)

| Component | Component Percent | Component Registry Number |
|---|---|---|
| Si | 60 | 7440-21-3 |
| Ti | 40 | 7440-32-6 |

IC ICM H01M004-38
ICS H01M004-02; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56
ST **lithium nonaq** electrolyte **battery** **anode** alloy; intermetallic alloy **anode** **lithium battery**
IT **Battery anodes**
(intermetallic phase-contg. Si alloy **anodes** for secondary **nonaq**. electrolyte **Li batteries**)
IT Intermetallic compounds
(intermetallic phase-contg. Si alloy **anodes** for secondary **nonaq**. electrolyte **Li batteries**)
IT 12017-12-8, Cobalt silicide (CoSi2) 12035-57-3, Nickel silicide (NiSi) **12039-83-7**, Titanium silicide (TiSi2) 12039-87-1, Vanadium silicide (VSi2) 12201-89-7, Nickel silicide (NiSi2) 151819-07-7 169217-08-7 **359860-38-1** 359860-39-2
(intermetallic phase-contg. Si alloy **anodes** for secondary **nonaq**. electrolyte **Li batteries**)

L46 ANSWER 7 OF 19 HCAPLUS COPYRIGHT 2003 ACS
2001:376912 Document No. 134:355488 Fabrication of secondary **battery** with anode containing silicon or a silicon compound. Tanizaki, Hiroaki; Omaru, Atsuo; Imoto, Hiroshi (Sony Corporation, Japan). Eur. Pat. Appl. EP 1102340 A2 20010523, 10 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO. (English). CODEN: EPXXDW.

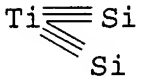
APPLICATION: EP 2000-125015 20001116. PRIORITY: JP 1999-331494 19991122.

AB The title **battery** comprises a winding electrode body wound a belt-shaped cathode and a belt-shaped anode with a separator. The anode is produced with crushed Si or or a Si compd. in an O partial pressure atm. within a value from >10 Pa to lower than an O partial pressure of air. By crushing Si or a Si compd. in such an O partial pressure atm., an oxide film formed thereon can become thinner and electron cond. between its particles can be improved, which leads to an improved charging-discharging property.

IT **12039-83-7P**, Titanium silicide tisi2
(fabrication of secondary **battery** with anode contg. silicon or silicon compd.)

RN 12039-83-7 HCAPLUS

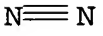
CN Titanium silicide (TiSi2) (6CI, 8CI, 9CI) (CA INDEX NAME)



IT **7727-37-9**, Nitrogen, uses
(fabrication of secondary **battery** with anode contg. silicon or silicon compd.)

RN 7727-37-9 HCAPLUS

CN Nitrogen (8CI, 9CI) (CA INDEX NAME)



IC ICM H01M004-38
ICS H01M004-58

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST **battery** anode silicon compd

IT Phenolic resins, reactions
(carbon blak; fabrication of secondary **battery** with anode contg. silicon or silicon compd.)

IT **Battery** anodes
Secondary **batteries**
(fabrication of secondary **battery** with anode contg. silicon or silicon compd.)

IT Polypropene fibers, uses
(fabrication of secondary **battery** with anode contg. silicon or silicon compd.)

IT Carbon black, uses
(phenolic resin-derived; fabrication of secondary **battery** with anode contg. silicon or silicon compd.)

IT 96-49-1, Ethylene carbonate 616-38-6, Dimethyl carbonate 7440-21-3, Silicon, uses 12190-79-3, Cobalt lithium oxide colio2 21324-40-3, Lithium hexafluorophosphate

(fabrication of secondary **battery** with anode contg. silicon or silicon compd.)

IT 409-21-2P, Silicon carbide sic, uses 12007-81-7P, Silicon boride sib4 12008-29-6P, Silicon boride sib6 12013-56-8P, Calcium silicide casi2 12017-12-8P, Cobalt silicide cosi2 12018-09-6P, Chromium silicide crsi2 12022-99-0P, Iron silicide fesi2 12032-86-9P, Manganese silicide mnsi2 12034-80-9P, Niobium silicide nbsi2 12039-79-1P, Tantalum silicide tasi2 **12039-83-7P**, Titanium silicide tisi2 12039-87-1P, Vanadium silicide vsi2 12039-88-2P, Tungsten silicide wsi2 12058-47-8P, Silicon nitride SiN4 12136-78-6P, Molybdenum silicide mosi2 12159-07-8P, Copper silicide cu5si 12201-89-7P, Nickel silicide nisi2 22831-39-6P, Magnesium silicide mg2si 339333-78-7P, Zinc silicide (ZnSi2)
(fabrication of secondary **battery** with anode contg. silicon or silicon compd.)

IT 7440-37-1, Argon, uses 7440-59-7, Helium, uses **7727-37-9**, Nitrogen, uses 7782-44-7, Oxygen, uses
(fabrication of secondary **battery** with anode contg. silicon or silicon compd.)

L46 ANSWER 8 OF 19 HCAPLUS COPYRIGHT 2003 ACS

2001:229199 Document No. 134:240182 Polymer **electrolyte** fuel **cells**. Nishida, Kazufumi; Niikura, Junji; Gyoten, Hisaaki; Hatoh, Kazuhito; Ohara, Hideo; Kanbara, Teruhisa; Fijii, Satoru (Matsushita Electric Industrial Co., Ltd., Japan). PCT Int. Appl. WO 2001022513 A1 20010329, 38 pp. DESIGNATED STATES: W: CN, JP, KR, US; RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE. (Japanese). CODEN: PIXXD2. APPLICATION: WO 2000-JP6073 20000906. PRIORITY: JP 1999-262970 19990917; JP 1999-298926 19991020.

AB The fuel cells have a polymer electrolyte membrane held between a cathode and an anode, anode side separators having fuel gas passages facing the anodes, cathode side separators having oxidant gas passages facing the cathodes; where the separators are metal plates, have oxidn. resistant conductive coating at least on part of the plate surface facing the electrode, and have a diffusion layer of the coating material at the coating-plate boundary.

IT **113151-72-7**, Aluminum titanium nitride
(separators contg. oxidn. resistant conductive coatings and diffusion layers for polymer **electrolyte** fuel **cells**)

RN 113151-72-7 HCAPLUS

CN Aluminum titanium nitride (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| N | x | 17778-88-0 |
| Ti | x | 7440-32-6 |
| Al | x | 7429-90-5 |

IC ICM H01M008-02
ICS H01M008-10
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST polymer **electrolyte** fuel **cell** separator oxidn resistant coating
IT Coating materials
Fuel cell separators
(separators contg. oxidn. resistant conductive coatings and diffusion layers for polymer **electrolyte** fuel **cells**)
IT 7440-25-7, Tantalum, uses 7440-33-7, Tungsten, uses 7440-47-3, Chromium, uses 7440-67-7, Zirconium, uses
(intermediate coatings for separators with oxidn. resistant conductive coatings for polymer **electrolyte** fuel **cells**)
IT 11107-04-3, Sus 316
(separators contg. oxidn. resistant conductive coatings and diffusion layers for polymer **electrolyte** fuel **cells**)
IT 1308-38-9, Chromium oxide (Cr2O3), uses 1344-28-1, Alumina, uses 7429-90-5, Aluminum, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-16-6, Rhodium, uses 7440-32-6, Titanium, uses 7440-57-5, Gold, uses 12033-62-4, Tantalum nitride (TaN) 12058-38-7, Tungsten nitride(WN) 12070-06-3, Tantalum carbide (TaC) 12070-08-5, Titanium carbide (TiC) 12070-12-1, Tungsten carbide (WC) 12070-14-3, Zirconium carbide (ZrC) 13463-67-7, Titania, uses 25583-20-4, Titanium nitride (TiN) 25658-42-8, Zirconium nitride (ZrN) 65666-56-0, Titanium zirconium nitride **113151-72-7**, Aluminum titanium nitride 244237-30-7, Chromium nitride (CrN)
(separators contg. oxidn. resistant conductive coatings and diffusion layers for polymer **electrolyte** fuel **cells**)

L46 ANSWER 9 OF 19 HCAPLUS COPYRIGHT 2003 ACS
2000:688871 Document No. 133:326943 Corrosion protection of steel in molten Li2CO3-K2CO3 and Na2CO3-K2CO3 mixtures in a hydrogen-containing atmosphere. Petrushina, I. M.; Qingfeng, L.; Borup, F.; Bjerrum, N. J. (Department of Chemistry, Technical University of Denmark, Lyngby, DK-2800, Den.). Journal of Applied Electrochemistry, 30(8), 929-937 (English) 2000. CODEN: JAELBJ. ISSN: 0021-891X. Publisher: Kluwer Academic Publishers.
AB The electrochem. behavior of TiN-, TiN-AlN-, Cr-, and CrN-coated 316L stainless steel in molten Li2CO3-K2CO3 and Na2CO3-K2CO3 melts in a reducing gaseous atm. (10% H2-90% N2) was studied using voltammetry and SEM combined with energy-dispersed x-ray anal. in the temp. range of 600-730.degree.. To facilitate the identification of the electrochem. reactions the voltammetric behavior of stainless steel, Ti, Ni, and Au was also investigated. Voltammetric characteristics obtained at AlN-TiN coated electrodes showed no anodic reactions at potentials more neg. than that of CO32- oxidn. Cr- and CrN-coated electrodes demonstrated a

suppressed anodic dissoln. after the first steady state voltammetric cycle. The voltammograms obtained for the other electrodes studied displayed the corresponding anodic metal-dissoln. waves. TiN, AlN, Cr, and CrN coatings seem to be the most promising as corrosion-resistant materials for the anodic compartments of molten carbonate fuel cells.

IT **108398-79-4**, Aluminum titanium nitride (AlTiN2)
(coating; corrosion protection of steel in molten Li2CO3-K2CO3 and Na2CO3-K2CO3 mixts. in hydrogen-contg. atm. by)

RN 108398-79-4 HCAPLUS

CN Aluminum titanium nitride (AlTiN2) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| N | 2 | 17778-88-0 |
| Ti | 1 | 7440-32-6 |
| Al | 1 | 7429-90-5 |

CC 72-6 (Electrochemistry)
Section cross-reference(s): 52, 55

ST steel anticorrosive coating corrosion carbonate melt; fuel **cell** carbonate **electrolyte** steel corrosion

IT Fuel **cell electrolytes**
(corrosion protection of steel in molten Li2CO3-K2CO3 and Na2CO3-K2CO3 fuel **cell electrolytes** in hydrogen-contg. atm.)

IT 7440-47-3, Chromium, uses 24094-93-7, Chromium nitride (CrN) 25583-20-4, Titanium nitride **108398-79-4**, Aluminum titanium nitride (AlTiN2)
(coating; corrosion protection of steel in molten Li2CO3-K2CO3 and Na2CO3-K2CO3 mixts. in hydrogen-contg. atm. by)

L46 ANSWER 10 OF 19 HCAPLUS COPYRIGHT 2003 ACS

2000:475906 Document No. 133:92002 Electroactive material for secondary **batteries** and methods of preparation. Chiang, Yet-Ming; Ceder, Gerbrand; Limthongkul, Pimpa (Massachusetts Institute of Technology, USA). PCT Int. Appl. WO 2000041256 A1 20000713, 91 pp. DESIGNATED STATES: W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG. (English). CODEN: PIXXD2. APPLICATION: WO 2000-US472 20000107. PRIORITY: US 1999-PV115299 19990108.

AB This invention provides a composite material for use as an electrode in electrochem. devices. An electroactive composite material includes a first electroactive metal, the electroactive material including a phase enriched in a metal or metal alloy, MeI, capable

of **intercalating** or alloying with a species selected from the group consisting of alkali metals and hydrogen, and a second material having the first active material intimately mixed therein. The second material includes a metal oxide, MeyIIOz, wherein the metals MeI have a less neg. Gibbs free energy for alloying or compd. formation with oxygen than the metals that comprise MeIIO. The materials of the invention comprise a first material that is an elemental metal, metal alloy, metal oxide, or other metal compd., selected so that it is able to alloy with lithium, and prepd. in a dispersed one-, two- or three-dimensional form. The first material is intimately mixed with or dispersed within a second material that may be substantially conductive to electrons or electron holes or lithium ions. The composite material may be prepd. by a process known as "partial redn." or "internal redn.", in which a precursor to the first material is preferentially reduced, or the process known as "partial oxidn.", in which a precursor to the second material is preferentially oxidized.

IT **109457-41-2P**, Tin titanium oxide ((Sn,Ti)O2)
(electroactive material for secondary **batteries** and methods of prepn.)

RN 109457-41-2 HCAPLUS

CN Tin titanium oxide ((Sn,Ti)O2) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 2 | 17778-80-2 |
| Ti | 0 - 1 | 7440-32-6 |
| Sn | 0 - 1 | 7440-31-5 |

IC ICM H01M004-38

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56

ST lithium **battery** anode; composite metal oxide lithium **battery** anode

IT Fluoropolymers, uses
(binder; electroactive material for secondary **batteries** and methods of prepn.)

IT **Battery** anodes
Coprecipitation
(electroactive material for secondary **batteries** and methods of prepn.)

IT Metals, uses
Oxides (inorganic), uses
(electroactive material for secondary **batteries** and methods of prepn.)

IT Carbon black, uses
(electroactive material for secondary **batteries** and methods of prepn.)

IT Alkali metals, processes
(electroactive material for secondary **batteries** and methods of prepn.)

IT Alloys, reactions
(electroactive material for secondary **batteries** and methods of prepn.)
IT Solidification
(eutectic; electroactive material for secondary **batteries** and methods of prepn.)
IT Secondary **batteries**
(lithium; electroactive material for secondary **batteries** and methods of prepn.)
IT Composites
(metal-metal oxide; electroactive material for secondary **batteries** and methods of prepn.)
IT Oxidation
Reduction
(partial; electroactive material for secondary **batteries** and methods of prepn.)
IT 24937-79-9, Pvdf
(binder; electroactive material for secondary **batteries** and methods of prepn.)
IT 96-49-1, Ethylene carbonate 616-38-6, Dimethyl carbonate 21324-40-3, Lithium hexafluorophosphate
(electroactive material for secondary **batteries** and methods of prepn.)
IT 12311-81-8P, Antimony vanadium oxide sbvo4 164078-79-9P, Antimony vanadium oxide Sb0.9V1.1O4
(electroactive material for secondary **batteries** and methods of prepn.)
IT **109457-41-2P**, Tin titanium oxide ((Sn,Ti)O2)
(electroactive material for secondary **batteries** and methods of prepn.)
IT 7429-90-5, Aluminum, uses 7440-25-7, Tantalum, uses 7782-42-5, Graphite, uses
(electroactive material for secondary **batteries** and methods of prepn.)
IT 1303-86-2, Boron oxide, uses 1314-13-2, Zinc oxide zno, uses 1314-60-9, Antimony pentoxide 1317-38-0, Copper oxide cuo, uses 1317-39-1, Copper oxide cu2o, uses
(electroactive material for secondary **batteries** and methods of prepn.)
IT 1333-74-0, Hydrogen, processes 7439-93-2, Lithium, processes
(electroactive material for secondary **batteries** and methods of prepn.)
IT 1301-96-8, Silver oxide ago 1309-64-4, Antimony trioxide, reactions 1314-61-0, Tantalum pentoxide 1314-62-1, Vanadium pentoxide, reactions 1344-43-0, Manganese oxide mno, reactions 7550-45-0, Titanium tetrachloride, reactions 7646-78-8, Tin tetrachloride, reactions 11143-56-9 39412-26-5 53608-05-2
(electroactive material for secondary **batteries** and methods of prepn.)
IT 61504-73-2P, Manganese silver oxide mn2ago4
(electroactive material for secondary **batteries** and methods of prepn.)

IT 124-38-9, Carbon dioxide, uses 630-08-0, Carbon monoxide, uses
(electroactive material for secondary **batteries** and methods of prepn.)
IT 1302-74-5P, Corundum, uses 1317-80-2P, Rutile 7440-21-3P, Silicon, uses 7440-22-4P, Silver, uses 7440-31-5P, Tin, uses 7440-42-8P, Boron, uses 7440-50-8P, Copper, uses 7440-55-3P, Gallium, uses 7440-56-4P, Germanium, uses 7440-66-6P, Zinc, uses 7440-74-6P, Indium, uses 12168-52-4P, Ilmenite 12194-71-7P, Perovskite 57176-38-2P, Manganese silver oxide
(mixed oxide contg.; electroactive material for secondary **batteries** and methods of prepn.)
IT 13463-67-7, Titania, reactions 18282-10-5, Tin dioxide 21645-51-2, Aluminum hydroxide, reactions
(mixed oxide contg.; electroactive material for secondary **batteries** and methods of prepn.)
IT 1317-34-6P, Manganese oxide Mn2O3 62975-03-5P, Copper manganese oxide Cu1.4Mn1.6O4
(mixed oxide contg.; electroactive material for secondary **batteries** and methods of prepn.)
IT 1314-34-7P, Vanadium oxide v2o3 7440-36-0P, Antimony, uses 12306-37-5P, Vanadium oxide v2o
(sample contg.; electroactive material for secondary **batteries** and methods of prepn.)

L46 ANSWER 11 OF 19 HCAPLUS COPYRIGHT 2003 ACS
2000:15554 Document No. 132:52432 Solid polymer **electrolyte** fuel **cells**. Nishida, Kazufumi; Yasumoto, Eiichi; Gyoten, Hisaaki; Hatoh, Kazuhito; Uchida, Makoto; Ohara, Hideo; Sugawara, Yasushi; Kanbara, Teruhisa; Matsumoto, Toshihiro; Niikura, Junji (Matsushita Electric Industrial Co., Ltd., Japan). PCT Int. Appl. WO 2000001025 A1 20000106, 47 pp. DESIGNATED STATES: W: CN, KR, US; RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE. (Japanese). CODEN: PIXXD2. APPLICATION: WO 1999-JP3464 19990628. PRIORITY: JP 1998-183757 19980630; JP 1998-183760 19980630; JP 1998-266221 19980921; JP 1999-58203 19990305.
AB The fuel cells have a solid polymer electrolyte membrane between an anode and a cathode, an anode-side conductive separator feeding fuel gas to the anode, and a cathode-side conductive separator feeding an oxidant to the cathode; where the separator plates are metal plates coated with an oxidn. resistant conductive film. The conductive film may be a carbonaceous film, an inorg. compd. film, or a metal plating film contg. hydrophobic particles.
IT **113151-72-7**, Aluminum titanium nitride
(oxidn. resistant coatings for metal separators in polymer **electrolyte** fuel **cells**)
RN 113151-72-7 HCAPLUS
CN Aluminum titanium nitride (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|

| | | |
|---|---|---|
| N | x | 17778-88-0 |
| Ti | x | 7440-32-6 |
| Al | x | 7429-90-5 |

IC ICM H01M008-02
ICS H01M008-10
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST polymer **electrolyte** fuel **cell** separator; fuel cell metal separator oxidn resistant coating
IT Pitch
(fluorinated; oxidn. resistant metal coatings contg. hydrophobic materials for metal separators in polymer **electrolyte** fuel **cells**)
IT Fuel cells
(intermediate layer between electrodes and separators in polymer **electrolyte** fuel **cells**)
IT Fuel cell separators
(metal separators with oxidn. resistant coatings for polymer **electrolyte** fuel **cells**)
IT Fluoropolymers, uses
(oxidn. resistant metal coatings contg. hydrophobic materials for metal separators in polymer **electrolyte** fuel **cells**)
IT 7440-74-6, Indium, uses
(indium doped tin oxide oxidn. resistant coatings for metal separators in polymer **electrolyte** fuel **cells**)
IT 7429-90-5, Aluminum, uses 7440-48-4, Cobalt, uses 7782-42-5, Graphite, uses
(intermediate layer between electrodes and separators in polymer **electrolyte** fuel **cells**)
IT 11107-04-3, Sus 316
(metal separators with oxidn. resistant coatings for polymer **electrolyte** fuel **cells**)
IT 409-21-2, Silicon carbide (SiC), uses 1317-36-8, Lead oxide (PbO), uses 1332-29-2D, Tin oxide, indium doped 25583-20-4, Titanium nitride (TiN) **113151-72-7**, Aluminum titanium nitride
(oxidn. resistant coatings for metal separators in polymer **electrolyte** fuel **cells**)
IT 7440-02-0, Nickel, uses 7440-22-4, Silver, uses 7440-47-3, Chromium, uses 7440-57-5, Gold, uses 9002-84-0, Polytetrafluoroethylene 11113-63-6, Graphite fluoride 25067-11-2, Hexafluoropropylene-tetrafluoroethylene copolymer 31784-04-0, Perfluoroethyl vinyl ether-tetrafluoroethylene copolymer
(oxidn. resistant metal coatings contg. hydrophobic materials for metal separators in polymer **electrolyte** fuel **cells**)

L46 ANSWER 12 OF 19 HCAPLUS COPYRIGHT 2003 ACS
1999:387867 Document No. 131:21333 Secondary **batteries**.
Osaki, Takashi; Murai, Takatsugu; Abe, Hiroshi (Nikkiso Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 11162509 A2 19990618 Heisei, 8 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1997-323585

19971125.

AB The **batteries** have cathodes composed of several cation **intercalating** inorg. salts, anodes composed of compds. capable of **intercalating** the cations, and an electrolyte soln. contg. the cations.

IT **12060-00-3**, Lead titanate (PbTiO3)
(cathodes from cation **intercalating** inorg. salt mixts. for secondary **batteries**)

RN 12060-00-3 HCAPLUS

CN Lead titanium oxide (PbTiO3) (8CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 3 | 17778-80-2 |
| Ti | 1 | 7440-32-6 |
| Pb | 1 | 7439-92-1 |

IC ICM H01M010-40
ICS H01M010-40; H01M004-02; H01M004-58

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST cation **intercalating** secondary **battery**

IT **Battery** cathodes
(cathodes from cation **intercalating** inorg. salt mixts. for secondary **batteries**)

IT Carbon fibers, uses
(cation **intercalating** anodes for secondary **batteries** with cation **intercalating** inorg. salt mixt. cathodes)

IT **Battery** electrolytes
(compns. of electrolytes for secondary **batteries** with cation **intercalating** inorg. salt mixt. cathodes)

IT Secondary **batteries**
(secondary **batteries** with cation **intercalating** inorg. salt mixt. cathodes)

IT 7783-21-3 12009-18-6, Barium stannate (BaSnO3) 12057-17-9, Lithium manganese oxide (LiMn2O4) **12060-00-3**, Lead titanate (PbTiO3) 12068-51-8, Magnesium aluminate (MgAl2O4) 12190-79-3, Cobalt lithium oxide (CoLiO2) 12323-37-4, Calcium cobalt oxide (CaCo2O4) 226554-52-5, Nickel zinc oxide (NiZnO3)
(cathodes from cation **intercalating** inorg. salt mixts. for secondary **batteries**)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 7790-98-9, Ammonium perchlorate 7791-03-9, Lithium perchlorate 10034-81-8, Magnesium perchlorate 13477-36-6, Calcium perchlorate 13637-76-8, Lead perchlorate 21324-40-3, Lithium hexafluorophosphate 21324-41-4, Barium hexafluorophosphate 194469-72-2
(compns. of electrolytes for secondary **batteries** with cation **intercalating** inorg. salt mixt. cathodes)

L46 ANSWER 13 OF 19 HCAPLUS COPYRIGHT 2003 ACS

1998:661778 Document No. 129:318684 Manufacture of spherical tin oxide powders, anode active mass, and secondary nonaqueous-electrolyte **battery** using it. Okano, Tomomizu; Yamashita, Hironari; Tachibana, Shoji (Tokuyama K. K., Japan). Jpn. Kokai Tokkyo Koho JP 10273321 A2 19981013 Heisei, 16 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1997-76164 19970327.

AB The Sn oxide powders are manufd. by the following steps: (1) forming an org. solvent soln. contg. a Sn compd. and/or Sn and .gtoreq.1 org.-solvent-sol. compd. selected from alk. earth metal compds., rare earth metal compds., transition metal compds., Group IIIA element compds., Group IVA element compds. (except for Sn compds.), Group VA element compds., and chalcogen compds. for the 2nd component element and (2) forming spherical gel from the soln. and firing to give the powders. The anode active mass composed of the obtained Sn oxide powders and the **battery** using the anode active mass and Li ion-**intercalation** materials as cathode active mass are also claimed. The powders have uniform compn. and fine structure of the powders can be controlled by the manufg. method. The **battery** has high discharge capacity.

IT **52907-84-3P**, Cerium tin oxide **139920-08-4P**, Tin titanium oxide
(manuf. of spherical tin oxide powders for anode active mass of nonaq.-electrolyte **battery**)

RN 52907-84-3 HCAPLUS
CN Cerium tin oxide (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | x | 17778-80-2 |
| Ce | x | 7440-45-1 |
| Sn | x | 7440-31-5 |

RN 139920-08-4 HCAPLUS
CN Tin titanium oxide (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | x | 17778-80-2 |
| Ti | x | 7440-32-6 |
| Sn | x | 7440-31-5 |

IC ICM C01G019-02
ICS H01M004-02; H01M004-04; H01M004-18; H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 49

ST tin oxide anode nonaq electrolyte **battery**; lithium ion **battery** tin oxide anode

IT **Battery** anodes
(manuf. of spherical tin oxide powders for anode active mass of nonaq.-electrolyte **battery**)

IT 11113-92-1P, Tin vanadium oxide 12673-86-8P, Antimony tin oxide 39409-74-0P, Niobium tin oxide 39467-03-3P, Magnesium tin oxide **52907-84-3P**, Cerium tin oxide 58500-40-6P, Silicon tin oxide 72779-38-5P, Aluminum tin oxide **139920-08-4P**, Tin titanium oxide 180795-32-8P, Antimony tin oxide silicide 214971-13-8P, Boron phosphorus tin oxide 214971-14-9P, Antimony boron phosphorus tin oxide 214971-15-0P, Selenium tin oxide
(manuf. of spherical tin oxide powders for anode active mass of nonaq.-electrolyte **battery**)

IT 78-10-4, Tetraethoxysilane 78-40-0, Triethoxyphosphine oxide 121-43-7, Trimethoxyboron 7440-31-5, Tin, uses 7446-70-0, Aluminum chloride (AlCl3), uses 7550-45-0, Titanium chloride (TiCl4), uses 7632-51-1, Vanadium chloride (VCl4) 7772-99-8, Tin chloride (SnCl2), uses 7786-30-3, Magnesium chloride (MgCl2), uses 7790-86-5, Cerium chloride (CeCl3) 10025-91-9, Antimony trichloride 10026-03-6, Selenium chloride (SeCl4) 10026-12-7, Niobium chloride (NbCl5)
(manuf. of spherical tin oxide powders for anode active mass of nonaq.-electrolyte **battery**)

L46 ANSWER 14 OF 19 HCAPLUS COPYRIGHT 2003 ACS
1998:351972 Document No. 129:83792 Secondary lithium **batteries** using tin containing multiple oxide anodes. Maeda, Takeshi; Nakanishi, Naoya; Kurokawa, Hiroshi; Fujimoto, Masahisa; Noma, Toshiyuki; Nishio, Koji (Sanyo Electric Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 10144316 A2 19980529 Heisei, 7 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1996-318736 19961113.

AB The **batteries** use anodes composed of a mixt. contg. 1-9 parts of an oxides of Sn and .gtoreq.1 of Li, Na, K, Mg, Ca, Ti, Zr, V, Nb, Ta, Mo, W, Mn, Fe, Rh, Ir, Cu, Zn, B, Al, Si, P, Ge, and Bi and 1 part of Li **intercalating** carbonaceous materials. The **batteries** are prevented from overcharging so that the charging-discharging cycle property is improved.

IT **123213-50-3P**, Tin zirconium oxide **139920-08-4P**, Tin titanium oxide
(anodes from tin contg. multiple oxide mixed with lithium **intercalating** carbonaceous materials for **batteries**)

RN 123213-50-3 HCAPLUS
CN Tin zirconium oxide (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | x | 17778-80-2 |
| Zr | x | 7440-67-7 |
| Sn | x | 7440-31-5 |

RN 139920-08-4 HCAPLUS
CN Tin titanium oxide (9CI) (CA INDEX NAME)

| Component | Ratio | Component |
|---|---|---|

| | | Registry Number |
|---|---|---|
| O | x | 17778-80-2 |
| Ti | x | 7440-32-6 |
| Sn | x | 7440-31-5 |

IC ICM H01M004-58
ICS H01M004-02; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST lithium **battery** tin metal oxide anode; carbonaceous material tin metal oxide anode
IT **Battery** anodes
(anodes from tin contg. multiple oxide mixed with lithium **intercalating** carbonaceous materials for **batteries**)
IT Coke
(anodes from tin contg. multiple oxide mixed with lithium **intercalating** carbonaceous materials for **batteries**)
IT Carbonaceous materials (technological products)
(anodes from tin contg. multiple oxide mixed with lithium **intercalating** carbonaceous materials for **batteries**)
IT 11113-92-1P, Tin vanadium oxide 12013-46-6P, Calcium tin oxide 12651-22-8P, Tin tungsten oxide 12673-88-0P, Molybdenum tin oxide 12773-26-1P, Potassium tin oxide 12773-27-2P, Sodium tin oxide 12777-45-6P, Bismuth tin oxide 12777-79-6P, Iron tin oxide 37349-60-3P, Tantalum tin oxide 39409-74-0P, Niobium tin oxide 39467-03-3P, Magnesium tin oxide 39467-17-9P, Tin zinc oxide 58500-40-6P, Silicon tin oxide 63055-52-7P, Germanium tin oxide 72779-38-5P, Aluminum tin oxide **123213-50-3P**, Tin zirconium oxide 126998-48-9P, Boron tin oxide 127989-52-0P, Manganese tin oxide **139920-08-4P**, Tin titanium oxide 143080-34-6P, Iridium tin oxide 143080-35-7P, Rhodium tin oxide 149887-77-4P, Copper tin oxide 160479-36-7P, Lithium tin oxide 209400-79-3P, Phosphorus tin oxide
(anodes from tin contg. multiple oxide mixed with lithium **intercalating** carbonaceous materials for **batteries**)
IT 7782-42-5, Graphite, uses
(anodes from tin contg. multiple oxide mixed with lithium **intercalating** carbonaceous materials for **batteries**)

L46 ANSWER 15 OF 19 HCAPLUS COPYRIGHT 2003 ACS
1997:629124 Document No. 127:300319 Electrochemical impedance property of Ti1-xAlxN films prepared by dynamic ion mixing method. Kamiya, Makoto; Nakamura, Isao; Takano, Ichiro; Sawada, Yoshio (Grad. Sch., Kogakuin Univ., Tokyo, 163-91, Japan). Hyomen Gijutsu, 48(9), 913-918 (Japanese) 1997. CODEN: HYGIEX. ISSN: 0915-1869. Publisher: Hyomen Gijutsu Kyokai.
AB Ti1-xAlxN films, with better corrosion resistance than Al-free TiN

films, were prepd. by dynamic ion mixing with 2 sources resp. for Ti and Al at fixed N concn. An a.c. impedance method was carried out on an **electrochem. cell** using as-prepd. film in 1 mol/dm3 HCl soln. The equiv. circuit of the cell, based on a typical parallel circuit, took the film resistance and capacity into consideration and was detd. by a circuit-simulation software. The optimum corrosion resistance was given at x = 0.3.

IT **108398-79-4P**, Aluminum titanium nitride (Al0.5Ti0.5N)
**113151-72-7P**, Aluminum titanium nitride **121017-24-1P**
, Aluminum titanium nitride (Al0.4Ti0.6N) **134775-15-8P**,
Aluminum titanium nitride (Al0.3Ti0.7N) **196929-04-1P**,
Aluminum titanium nitride (Al0.17Ti0.83N) **196929-05-2P**,
Aluminum titanium nitride (Al0.84Ti0.16N)
(anticorrosive property of AlTiN film prepd. by dynamic ion mixing method)

RN 108398-79-4 HCAPLUS
CN Aluminum titanium nitride (AlTiN2) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| N | 2 | 17778-88-0 |
| Ti | 1 | 7440-32-6 |
| Al | 1 | 7429-90-5 |

RN 113151-72-7 HCAPLUS
CN Aluminum titanium nitride (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| N | x | 17778-88-0 |
| Ti | x | 7440-32-6 |
| Al | x | 7429-90-5 |

RN 121017-24-1 HCAPLUS
CN Aluminum titanium nitride (Al0.4Ti0.6N) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| N | 1 | 17778-88-0 |
| Ti | 0.6 | 7440-32-6 |
| Al | 0.4 | 7429-90-5 |

RN 134775-15-8 HCAPLUS
CN Aluminum titanium nitride (Al0.3Ti0.7N) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| N | 1 | 17778-88-0 |

| | | |
|---|---|---|
| Ti | 0.7 | 7440-32-6 |
| Al | 0.3 | 7429-90-5 |

RN 196929-04-1 HCAPLUS
CN Aluminum titanium nitride (Al0.17Ti0.83N) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| N | 1 | 17778-88-0 |
| Ti | 0.83 | 7440-32-6 |
| Al | 0.17 | 7429-90-5 |

RN 196929-05-2 HCAPLUS
CN Aluminum titanium nitride (Al0.84Ti0.16N) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| N | 1 | 17778-88-0 |
| Ti | 0.16 | 7440-32-6 |
| Al | 0.84 | 7429-90-5 |

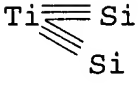
CC 72-6 (Electrochemistry)
Section cross-reference(s): 73
IT **108398-79-4P**, Aluminum titanium nitride (Al0.5Ti0.5N)
**113151-72-7P**, Aluminum titanium nitride **121017-24-1P**
, Aluminum titanium nitride (Al0.4Ti0.6N) **134775-15-8P**,
Aluminum titanium nitride (Al0.3Ti0.7N) **196929-04-1P**,
Aluminum titanium nitride (Al0.17Ti0.83N) **196929-05-2P**,
Aluminum titanium nitride (Al0.84Ti0.16N)
(anticorrosive property of AlTiN film prepd. by dynamic ion mixing method)

L46 ANSWER 16 OF 19 HCAPLUS COPYRIGHT 2003 ACS
1996:307665 Document No. 124:358003 Manufacture of semiconductor device and apparatus for it. Hirao, Takashi; Yoshida, Tetsuhisa; Kitagawa, Masatoshi (Matsushita Electric Ind Co Ltd, Japan). Jpn. Kokai Tokkyo Koho JP 08055818 A2 19960227 Heisei, 8 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1995-143083 19950609. PRIORITY: JP 1994-128941 19940610.
AB The title manuf. comprises simultaneous irradn. of a semiconductor thin film or a substrate with H+ and a dopant element-contg. ion in a reduced atm., followed by forming a thin film or annealing without exposure to air. The app. for the manuf. is also claimed. The method is useful for manuf. of large-area semiconductor devices, e.g. thin-film transistor arrays for liq.-crystal display panels and solar **batteries**, with good reliability.
IT **7727-37-9D**, Nitrogen, ions, uses
(dopant; manuf. of large-area semiconductor device involving ion implantation and annealing in closed system)
RN 7727-37-9 HCAPLUS

CN Nitrogen (8CI, 9CI) (CA INDEX NAME)



IT **12039-83-7**, Titanium silicide (TiSi2)
(manuf. of large-area semiconductor device involving ion implantation and annealing in closed system)
RN 12039-83-7 HCAPLUS
CN Titanium silicide (TiSi2) (6CI, 8CI, 9CI) (CA INDEX NAME)



IT **11106-92-6**
(manuf. of large-area semiconductor device involving ion implantation and annealing in closed system)
RN 11106-92-6 HCAPLUS
CN Aluminum alloy, nonbase, Al,Ti (9CI) (CA INDEX NAME)

| Component | Component Registry Number |
|---|---|
| Al | 7429-90-5 |
| Ti | 7440-32-6 |

IC ICM H01L021-265
ICS H01L021-205; H01L029-786; H01L021-336; H01L031-04
CC 76-3 (Electric Phenomena)
Section cross-reference(s): 74
IT 7440-38-2D, Arsenic, ions, uses 7440-42-8D, Boron, ions, uses 7723-14-0D, Phosphorus, ions, uses **7727-37-9D**, Nitrogen, ions, uses
(dopant; manuf. of large-area semiconductor device involving ion implantation and annealing in closed system)
IT **12039-83-7**, Titanium silicide (TiSi2)
(manuf. of large-area semiconductor device involving ion implantation and annealing in closed system)
IT 7440-21-3, Silicon, processes **11106-92-6**
(manuf. of large-area semiconductor device involving ion implantation and annealing in closed system)

L46 ANSWER 17 OF 19 HCAPLUS COPYRIGHT 2003 ACS
1995:370901 Document No. 122:165589 Nonaqueous electrolyte secondary **batteries**. Maeda, Takeshi; Fujimoto, Masahisa; Yoshimura, Seiji; Nishio, Koji; Saito, Toshihiko (Sanyo Electric Co, Japan). Jpn. Kokai Tokkyo Koho JP 06338325 A2 19941206 Heisei, 5 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1993-151612 19930527.

PRIORITY: JP 1993-96873 19930330.

AB Anodes in the **batteries** comprise alkali metal (e.g., Li) ion- or alk. earth metal (e.g., Ca) ion-**intercalatable** complex oxides of Sn and 1 metal selected from Li, Ti, Zr, V, Nb, Ta, Mo, W, Mn, Fe, Rh, Ir, Cu, Si, Na, K, Mg, Ca, Bi, and Ge. The anodes may comprise complex oxides of Sn and 1 metal selected from Ta, Nb, W, Mo, and Rh. Thus, a **battery** using Li-contg. MnO2 cathode, Ta Sn oxide anode, and electrolyte from LiClO4-dissolved ethylene carbonate and di-Me carbonate showed high and durable discharging property.

IT **12340-09-9**, Tin titanium oxide (SnTiO3) **123213-50-3**, Tin zirconium oxide
(anodes; tin complex oxide anodes in nonaq.-electrolyte secondary **batteries**)

RN 12340-09-9 HCAPLUS

CN Tin titanium oxide (SnTiO3) (8CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 3 | 17778-80-2 |
| Ti | 1 | 7440-32-6 |
| Sn | 1 | 7440-31-5 |

RN 123213-50-3 HCAPLUS

CN Tin zirconium oxide (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | x | 17778-80-2 |
| Zr | x | 7440-67-7 |
| Sn | x | 7440-31-5 |

IC ICM H01M004-58
ICS H01M004-02; H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST **battery** anode tin complex oxide; nonaq electrolyte **battery** anode oxide; lithium **battery** anode metal oxide

IT Anodes
(**battery**, tin complex oxide anodes in nonaq.-electrolyte secondary **batteries**)

IT 11113-92-1, Tin vanadium oxide 12013-46-6, Calcium tin oxide **12340-09-9**, Tin titanium oxide (SnTiO3) 12651-22-8, Tin tungsten oxide 12673-88-0, Molybdenum tin oxide 12773-26-1, Potassium tin oxide 12773-27-2, Sodium tin oxide 12777-45-6, Bismuth tin oxide 12777-79-6, Iron tin oxide 37349-60-3, Tantalum tin oxide 39409-74-0, Niobium tin oxide 39467-03-3, Magnesium tin oxide 58500-40-6, Silicon tin oxide 63055-52-7, Germanium tin oxide **123213-50-3**, Tin zirconium oxide 127989-52-0, Manganese tin oxide 143080-34-6, Iridium tin oxide

143080-35-7, Rhodium tin oxide 149887-77-4, Copper tin oxide
160479-36-7, Lithium tin oxide
(anodes; tin complex oxide anodes in nonaq.-electrolyte secondary **batteries**)

L46 ANSWER 18 OF 19 HCAPLUS COPYRIGHT 2003 ACS
1995:305207 Document No. 122:60165 Secondary nonaqueous **batteries** with improved cathodes and their manufacture. Sakata, Akihito; Iwasaki, Fumiharu; Yahagi, Seiji; Tawara, Kensuke; Ishikawa, Hideki (Seiko Instr & Electronics, Japan; Seiko Electronic Components). Jpn. Kokai Tokkyo Koho JP 06275269 A2 19940930 Heisei, 6 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1993-62265 19930322.
AB The **batteries** use perovskite RMO3 or its Li contg. deriv. for cathodes. The **batteries** are prepd. by electrochem. reacting the perovskite oxide with Li or a Li compd. inside or outside the **battery**.
IT **12060-00-3**, Lead titanate (PbTiO3)
(perovskite; lithium **intercalating** perovskite oxide cathodes for **batteries** and their manuf.)
RN 12060-00-3 HCAPLUS
CN Lead titanium oxide (PbTiO3) (8CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 3 | 17778-80-2 |
| Ti | 1 | 7440-32-6 |
| Pb | 1 | 7439-92-1 |

IC ICM H01M004-58
ICS H01M004-02; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST lithium **battery** perovskite oxide cathode
IT Cathodes
(**battery**, lithium **intercalating** perovskite oxide cathodes for **batteries** and their manuf.)
IT 12047-27-7, Barium titanate (BaTiO3), uses **12060-00-3**, Lead titanate (PbTiO3) 54990-20-4, Manganese titanate
(perovskite; lithium **intercalating** perovskite oxide cathodes for **batteries** and their manuf.)

L46 ANSWER 19 OF 19 HCAPLUS COPYRIGHT 2003 ACS
1989:120022 Document No. 110:120022 Ceramic molds and punches for manufacture of **dry-cell-battery** cathodes. Nishiyama, Akio; Ito, Naohisa; Kimura, Keiichi (Mitsubishi Metal Corp., Japan). Jpn. Kokai Tokkyo Koho JP 63195172 A2 19880812 Showa, 5 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1987-26055 19870206.
AB The title molds and punches are prepd. from ceramics contg. 2-20% bonding phase of nitride oxide contg. .gtoreq.1 of Mg, Y, and rare earth and .gtoreq.1 of Si and Al and the balance of a matrix phase

of Si3N4 and/or Sialon, have a relative d. >98%, a surface roughness >1.3 S(S = surfaceness), and contains no >2-.mu.m pores at the surface. The ceramics can also contain 0.5-40% carbides and/or oxide of Group 4-6 (IV-B-VIB) element(s) and/or nitrides of Group-4-5 element(s) and/or their solid soln(s). Thus, powders (particle size 0.5-3 .mu.m) of Si3N4, SiO2, AlN, Al2O3, MgO, Y2O3, La2O3, CeO2, and the above carbides, oxides, nitrides, and their solid solns. were mixed at appropriate ratios, wet milled, dried, pressed at 1 ton/cm2, sintered at 1750.degree. in 1-**atm** **N** for 2 h or hot pressed at 1650.degree. in N to obtain ceramic molds and punches. These molds and punches had lifetime of 2 .times. 106-8 .times. 106 shots in manuf. of MnO2 cathode pellets for **dry-cell** battries, vs. 5 .times. 104-3 .times. 105 shots for WC-6% Co, SUS 304, and Stellite molds and punches.

IT **59993-77-0**
(bonding phase, Sialon and silicon nitride ceramics contg., molds and punches from, for **dry-cell** **battery** cathode manuf.)

RN 59993-77-0 HCAPLUS

CN Cerium alloy, nonbase, Ce,Si (9CI) (CA INDEX NAME)

| Component | Component Registry Number |
|---|---|
| Ce | 7440-45-1 |
| Si | 7440-21-3 |

IC ICM C04B035-58
ICS C04B035-58; H01M004-08

CC 57-2 (Ceramics)
Section cross-reference(s): 52

ST Silaon mold **battery** cathode molding; silicon nitride mold punch; nitride oxide ceramic mold

IT Ceramic materials and wares
(Silaon, contg. nitride oxide bonding phase molds and punches from, for **dry-cell** **battery**-cathode manuf.)

IT Molds (forms)
(ceramic, Sialon or silicon nitride, contg. nitride oxide bonding phase, for **dry-cell-battery** cathode manuf.)

IT Cathodes
(**battery**, **dry-cell**, manuf. of, molds and punches from Sialon or silicon nitride ceramics contg. nitride oxide bonding phase for)

IT **59993-77-0** 80619-58-5, Magnesium nitride oxide silicide 116305-21-6, Aluminum yttrium nitride oxide silicide 119000-03-2 119000-04-3 119537-73-4
(bonding phase, Sialon and silicon nitride ceramics contg., molds and punches from, for **dry-cell** **battery** cathode manuf.)

IT 1308-38-9, Chromia, uses and miscellaneous 1314-23-4, Zirconia, uses and miscellaneous 7440-25-7, Tantalum, uses and miscellaneous 12069-89-5, Molybdenum carbide (Mo2C) 12070-08-5, Titanium carbide (TiC) 12070-12-1, Tungsten carbide (WC) 12347-09-0, Titanium carbide nitride (Ti(C,N)) 13463-67-7, Titania, uses and miscellaneous 24621-21-4, Niobium nitride (NbN) 25583-20-4, Titanium nitride (TiN) 25817-87-2, Hafnium nitride (HfN) 37311-45-8, Zirconium nitride oxide 61331-90-6, Titanium carbide nitride oxide
(ceramics contg., Sialon- and silicon nitride-based, molds and punches from, for **dry-cell-battery** cathode manuf.)

IT 12033-89-5, Silicon nitride (Si3N4), uses and miscellaneous
(ceramics, contg. nitride oxide bonding phase, molds and punches from, for **dry-cell battery**-cathode manuf.)

=> d l47 1-36 cbib abs hitstr hitind

L47 ANSWER 1 OF 36 HCAPLUS COPYRIGHT 2003 ACS
2002:656318 Document No. 137:188225 Anode material, its manufacture, and anode for secondary nonaqueous **battery**. Yashiro, Masanari; Uenaka, Hideya; Negi, Noriyuki (Sumitomo Metal Industries Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2002246017 A2 20020830, 9 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2001-42041 20010219.

AB The title material is (1) alloy powder having .gtoreq.1 alkali metal ion-**intercalating** active phase or (2) alloy powder having the active phase and .gtoreq.1 inactive phase which does not **intercalate** an alkali metal ion, where the alloy powder having grain size .ltoreq.45 .mu.m shows specific elec. resistance .ltoreq.100 .times. 10 7 .OMEGA..cntdot.m at 25.degree. while pressing under 9800 Pa. The material is manufd. by melting a raw material and then solidifying, where the process comprises treating the material under nonoxidizing atm. at material temp. .gtoreq.300.degree.. The title anode using the above material provides high discharge capacity and long cycle life.

IT **449205-17-8**
(anode contg. alkali metal ion-**intercalating** alloy manufd. by melting and solidifying for **battery**)

RN 449205-17-8 HCAPLUS
CN Tin alloy, base, Sn 73,Zr 27 (9CI) (CA INDEX NAME)

| Component | Component Percent | Component Registry Number |
|---|---|---|
| Sn | 73 | 7440-31-5 |
| Zr | 27 | 7440-67-7 |

IC ICM H01M004-38
ICS H01M004-02; H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 55, 56
ST alloy anode manuf secondary nonaq **battery**
IT **Battery** anodes
Melting
Solidification
(anode contg. alkali metal ion-**intercalating** alloy manufd. by melting and solidifying for **battery**)
IT 37352-26-4 39445-99-3 53863-06-2 55918-93-9 62186-40-7
68824-64-6 72626-85-8 77088-26-7 102384-22-5 107482-99-5
119281-87-7 122311-67-5 148768-22-3 201856-16-8 217075-61-1
252231-06-4 449205-10-1 449205-11-2 449205-12-3 449205-13-4
449205-14-5 449205-15-6 449205-16-7 **449205-17-8**
449205-18-9 449205-19-0 449205-20-3 449205-21-4 449205-22-5
449205-23-6 449205-24-7 449205-25-8 449205-26-9
(anode contg. alkali metal ion-**intercalating** alloy manufd. by melting and solidifying for **battery**)

L47 ANSWER 2 OF 36 HCAPLUS COPYRIGHT 2003 ACS
2002:447283 Document No. 137:22375 Anode active mass for secondary nonaqueous **battery** and its manufacture. Negi, Noriyuki; Asabe, Kazutaka; Kohiyori, Motoji; Yashiro, Masanari; Uenaka, Hideya (Sumitomo Metal Industries, Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2002170560 A2 20020614, 13 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2001-9279 20010117. PRIORITY: JP 2000-290572 20000925.
AB The active mass has an alkali metal ion **intercalating** active phase, which has an element filling ratio .ltoreq.75 vol.% and .ltoreq.90vol.%, in its crystal lattice, before and after charging and is composed of Pa-3 cubic, tetragonal, monoclinic, hexagonal, and/or triclinic crystals. The active phase is selected from Cu3P, Al11Mn4, Al10Mn3, Al23V4, FeS2, S2Ti, S2Zr, Cr2S3, In2S3, In3Sn, MnSn2, FeSn2, PbSn, PbSn4, AuSn, Ag3Sn, ZrSn2, InSn4, Cu4Sn5, Mn3C, Fe3C, Ni3B, and Ni(OH)2. The active mass is prepd. by solidifying melted raw material at a cooling rate .gtoreq.1000.degree./s.
IT **12166-60-8**
(lithium **intercalating** active phase with controlled cryst. structure and filling ratio for secondary **battery** anodes)
RN 12166-60-8 HCAPLUS
CN Tin, compd. with zirconium (2:1) (8CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Zr | 1 | 7440-67-7 |
| Sn | 2 | 7440-31-5 |

IT **434336-85-3P**
(manuf. of multiphase lithium **intercalating** anode active mass with controlled cryst. structure and filling ratio

for secondary **batteries**)
RN 434336-85-3 HCAPLUS
CN Tin alloy, base, Sn 67,Zr 33 (9CI) (CA INDEX NAME)

| Component | Component Percent | Component Registry Number |
|---|---|---|
| Sn | 67 | 7440-31-5 |
| Zr | 33 | 7440-67-7 |

IC ICM H01M004-36
ICS C22C009-00; C22C011-00; C22C012-00; C22C013-00; C22C014-00; C22C016-00; C22C018-00; C22C019-00; H01M004-02; H01M004-38; H01M004-52; H01M004-58; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST **battery** alkali metal **intercalating** anode active mass manuf; cryst structure alkali metal **intercalating** anode **battery**
IT **Battery** anodes
(lithium **intercalating** anode active mass contg. active phase with controlled cryst. structure and filling ratio for secondary lithium **batteries**)
IT 11070-90-9 12006-60-9 12007-02-2, Nickel boride (Ni3B) 12011-67-5, Iron carbide (Fe3C) 12018-22-3, Chromium sulfide (Cr2S3) 12019-57-7, Copper phosphide (Cu3P) 12019-69-1 12023-01-7 12030-16-9 12032-87-0 12039-13-3, Titanium sulfide (TiS2) 12039-15-5, Zirconium sulfide (ZrS2) 12041-38-2 12043-87-7 12054-48-7, Nickel hydroxide (Ni(OH)2) 12066-69-2 12068-85-8, Iron sulfide (FeS2) 12121-90-3, Manganese carbide (Mn3C) **12166-60-8** 12186-93-5 12339-64-9 12631-84-4, Indium sulfide (113In2S3) 60921-68-8
(lithium **intercalating** active phase with controlled cryst. structure and filling ratio for secondary **battery** anodes)
IT 7439-93-2, Lithium, uses
(lithium **intercalating** anode active mass contg. active phase with controlled cryst. structure and filling ratio for secondary lithium **batteries**)
IT 37314-13-9P 88907-03-3P 101304-51-2P 120901-30-6P 121152-38-3P 129937-12-8P 145714-52-9P 153813-34-4P 168900-39-8P 186136-85-6P 246157-76-6P 434336-77-3P 434336-78-4P 434336-79-5P 434336-80-8P 434336-81-9P 434336-82-0P 434336-83-1P 434336-84-2P **434336-85-3P** 434336-86-4P 434336-87-5P 434336-88-6P 434336-89-7P 434336-90-0P 434336-91-1P 434336-92-2P 434336-93-3P 434336-94-4P 434336-95-5P 434336-96-6P 434336-97-7P 434336-98-8P 434336-99-9P 434337-00-5P 434337-01-6P 434337-02-7P 434337-03-8P 434337-04-9P 434337-05-0P 434337-06-1P 434337-07-2P 434337-08-3P 434337-09-4P 434337-10-7P 434337-11-8P 434337-12-9P 434337-13-0P 434337-14-1P
(manuf. of multiphase lithium **intercalating** anode

active mass with controlled cryst. structure and filling ratio for secondary **batteries**)

L47 ANSWER 3 OF 36 HCAPLUS COPYRIGHT 2003 ACS
2002:306809 Document No. 136:328164 Tin based multiple oxide, its manufacture, **battery anode**, and the **battery**. Takahashi, Naoto; Okano, Tomoki; Tachibana, Shouji (Tokuyama Corp., Japan). Jpn. Kokai Tokkyo Koho JP 2002121023 A2 20020423, 12 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-308109 20001006.

AB The oxide contains Sn and .gtoreq.1 other metal, with compns. of any fine sections having cross-sectional area 9-25 nm2 being the same as the overall compn. of the oxide. The oxide is prepd. by dissolving Sn halide and org. solvent sol. compd(s). of the other metal(s) in an org. solvent, simultaneously adding the org. soln. and an aq. soln. of a basic compd. to an alc. to ppt. a reaction product, and heating the ppt.; where the mol of basic compd. in the aq. soln. is controlled a 1.3-1.6 time the total mol of halide in the org. soln. Secondary **nonaq**. electrolyte **battery** uses the oxide for **anode**.

IT **123213-50-3P**, Tin zirconium oxide
(compns. and manuf. of tin based multiple oxide with homogeneous component distribution for secondary **lithium battery anodes**)

RN 123213-50-3 HCAPLUS
CN Tin zirconium oxide (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | x | 17778-80-2 |
| Zr | x | 7440-67-7 |
| Sn | x | 7440-31-5 |

IC ICM C01G019-00
ICS C01B033-00; C01G025-00; H01M004-02; H01M004-58; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST secondary **nonaq** batter **anode** tin metal oxide manuf
IT **Battery anodes**
(compns. and manuf. of tin based multiple oxide with homogeneous component distribution for secondary **lithium battery anodes**)
IT 58500-40-6P, Silicon tin oxide **123213-50-3P**, Tin zirconium oxide
(compns. and manuf. of tin based multiple oxide with homogeneous component distribution for secondary **lithium battery anodes**)

L47 ANSWER 4 OF 36 HCAPLUS COPYRIGHT 2003 ACS
2002:172345 Document No. 136:206838 Wet process for semiconductor device fabrication using anode water containing **oxidative**

substances and cathode water containing reductive substances, and anode water and cathode water used in the wet process. Park, Im-soo; Lee, Kun-tack; Kwon, Young-min; Hah, Sang-rok; Shim, Woo-gwan; Ko, Hyung-ho (S. Korea). U.S. Pat. Appl. Publ. US 20020027084 A1 20020307, 19 pp. (English). CODEN: USXXCO. APPLICATION: US 2001-945722 20010905. PRIORITY: KR 2000-52661 20000906.

AB A wet process performed in the manuf. of semiconductor devices with cathode water and anode water produced from electrolyte using a 3-**cell electrolyzer** having an intermediate **cell** for the **electrolyte**. The 3-**cell electrolyzer** includes an anode cell, a cathode cell, and an intermediate cell between the anode and cathode cells, which are partitioned by ion exchange membranes. Deionized water is supplied into the anode and cathode cells, and the intermediate cell is filled with an electrolytic aq. soln. to perform electrolysis. The anode water contg. **oxidative** substances or the cathode water contg. reductive substances, which are produced by the electrolysis process, are used in the wet process.

IT **12738-91-9**, Titanium silicide
(cleaning of W layer by wet process for semiconductor device fabrication using anode water contg. **oxidative** substances and cathode water contg. reductive substances in 3-**cell electrolyzer**)

RN 12738-91-9 HCAPLUS

CN Titanium silicide (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Ti | x | 7440-32-6 |
| Si | x | 7440-21-3 |

IC ICM C25B001-00

NCL 205464000

CC 72-9 (Electrochemistry)
Section cross-reference(s): 48, 61

IT Polishing
(electrochem.; of copper electrodeposited using wet process for semiconductor device fabrication using anode water contg. **oxidative** substances and cathode water contg. reductive substances)

IT Water purification
(electrolysis; wet process for semiconductor device fabrication using anode water contg. **oxidative** substances and cathode water contg. reductive substances)

IT Redox potential
pH
(of anode water contg. **oxidative** substances and cathode water contg. reductive substances formed in 3-**cell electrolyzer**)

IT Cleaning

(of electrodeposits using wet process for semiconductor device fabrication using anode water contg. **oxidative** substances and cathode water contg. reductive substances)

IT Semiconductor devices
(wet process for semiconductor device fabrication using anode water contg. **oxidative** substances and cathode water contg. reductive substances)

IT **Electrolytic cells**
(**wet** process for semiconductor device fabrication using anode water contg. **oxidative** substances and cathode water contg. reductive substances in 3-**cell electrolyzer**)

IT 7440-32-6, Titanium, processes 7440-33-7, Tungsten, processes 12627-41-7, Tungsten silicide **12738-91-9**, Titanium silicide
(cleaning of W layer by wet process for semiconductor device fabrication using anode water contg. **oxidative** substances and cathode water contg. reductive substances in 3-**cell electrolyzer**)

IT 7440-50-8P, Copper, processes
(electrodeposition using wet process for semiconductor device fabrication using anode water contg. **oxidative** substances and cathode water contg. reductive substances)

IT 1336-21-6, Ammonium hydroxide 7647-01-0, Hydrochloric acid, reactions 7664-39-3, Hydrofluoric acid, reactions 12125-01-8, Ammonium fluoride
(wet process for semiconductor device fabrication using anode water contg. **oxidative** substances and cathode water contg. reductive substances formed by electrolysis of soln. contg.)

L47 ANSWER 5 OF 36 HCAPLUS COPYRIGHT 2003 ACS

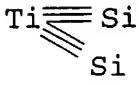
2001:780558 Document No. 135:346844 Anode active mass for secondary nonaqueous **batteries** and its manufacture. Takeshita, Yukiteru; Negi, Noriyuki; Yamamoto, Hiroyoshi; Kohiyori, Motoji; Yonemura, Koji; Nitta, Yoshiaki; Shimamura, Harushige (Sumitomo Metal Industries Ltd., Japan; Matsushita Electric Industrial Co., Ltd.). Jpn. Kokai Tokkyo Koho JP 2001297757 A2 20011026, 16 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-113912 20000414.

AB The anode active mass has a 1st part contg. .gtoreq.1 Li **intercalating** metal (M) phase, and a 2nd part contg. .gtoreq.1 phases of intermetallic compds. or solid solns. of M with >1 non-M elements selected from Group 2, transition metal, and Group 13-15 elements or the non-M element alone; where a portion of the 2nd part has a granular and/or an acicular structure, and a portion of the 2nd part is surrounded by a layered structure of the 2 parts or by the 1st part or the 1st part in a fine granular structure. The anode active mass is prepd. by a rapidly solidifying melted compn. at .gtoreq.100.degree./s.

IT **12039-83-7P**, Titanium silicide (TiSi2) **370598-30-4P**, Titanium silicide (Ti0.39Si0.61) **370598-39-3P**, Neodymium silicide (Nd0.64Si0.35)

(compns. and structure and manuf. of silicon based multiphase anode active mass for secondary lithium **batteries**)

RN 12039-83-7 HCAPLUS
CN Titanium silicide (TiSi2) (6CI, 8CI, 9CI) (CA INDEX NAME)



RN 370598-30-4 HCAPLUS
CN Titanium silicide (Ti0.39Si0.61) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Ti | 0.39 | 7440-32-6 |
| Si | 0.61 | 7440-21-3 |

RN 370598-39-3 HCAPLUS
CN Neodymium silicide (Nd0.64Si0.35) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Si | 0.35 | 7440-21-3 |
| Nd | 0.64 | 7440-00-8 |

IC ICM H01M004-38
ICS H01M004-02; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST secondary **battery** anode active mass multiphase structure manuf; lithium **battery** anode active mass multiphase structure
IT **Battery** anodes
(compns. and structure and manuf. of multiphase anode active mass for secondary lithium **batteries**)
IT Crystallization
(controlled cooling rate in manuf. of multiphase anode active mass for secondary lithium **batteries**)
IT 7429-90-5P, Aluminum, uses 7440-31-5P, Tin, uses 7440-41-7P, Beryllium, uses 12137-64-3P, Silicon phosphide (SiP) 12394-61-5P 106698-75-3P, Aluminum silicide 145998-02-3P, Germanium silicide (GeSi) 158616-16-1P, Tin silicide (SnSi2) 370598-45-1P 370598-46-2P 370598-47-3P, Cobalt iron silicide (Co0.41Fe0.02Si0.57) 370598-48-4P, Titanium zinc silicide (Ti0.4Zn0.01Si0.59) 370598-49-5P, Beryllium silicide (Be0.87Si0.13)
(compns. and structure and manuf. of multiphase anode active mass for secondary lithium **batteries**)
IT 7440-21-3P, Silicon, uses 12017-12-8P, Cobalt silicide (CoSi2)

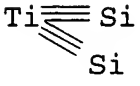
12018-09-6P, Chromium silicide (CrSi2) 12022-99-0P, Iron silicide (FeSi2) 12032-85-8DP, Manganese silicide (MnSi), silicon deficient 12035-57-3P, NiSi **12039-83-7P**, Titanium silicide (TiSi2) 12039-87-1P, Vanadium silicide (VSi2) 12039-88-2P, Tungsten silicide (WSi2) 12201-89-7P, Nickel silicide (NiSi2) 12371-64-1P, Iron silicide (Fe2Si3) 12535-46-5P, Vanadium silicide (V2Si3) 12643-20-8P, Copper silicide 22831-39-6P, Magnesium silicide (Mg2Si) 370598-28-0P, Cobalt silicide (Co0.42Si0.58) 370598-29-1P, Cobalt silicide (Co0.38Si0.62) **370598-30-4P**, Titanium silicide (Ti0.39Si0.61) 370598-31-5P, Manganese silicide (Mn0.48Si0.52) 370598-33-7P, Chromium silicide (Cr0.48Si0.6) 370598-34-8P, Tungsten silicide (W0.7Si0.3) 370598-38-2P, Magnesium silicide (Mg0.48Si0.52) **370598-39-3P**, Neodymium silicide (Nd0.64Si0.35) 370598-40-6P, Cobalt tin silicide (Co0.43Sn0.01Si0.56) 370598-41-7P, Aluminum titanium silicide (Al0.01Ti0.41Si0.58) 370598-42-8P, Vanadium phosphide silicide (V0.42P0.01Si0.57) 370598-43-9P, Cobalt germanium silicide (Co0.42Ge0.03Si0.55) 370598-44-0P, Germanium titanium zinc silicide (Ge0.15Ti0.39Zn0.01Si0.45)
(compns. and structure and manuf. of silicon based multiphase anode active mass for secondary lithium **batteries**)

L47 ANSWER 6 OF 36 HCAPLUS COPYRIGHT 2003 ACS
2001:763375 Document No. 135:320488 Secondary nonaqueous electrolyte **batteries**. Nitta, Yoshiaki; Bito, Yasuhiko; Sato, Toshitada; Okamura, Kazuhiro; Shimamura, Harunari (Matsushita Electric Industrial Co., Ltd., Japan). PCT Int. Appl. WO 2001078167 A1 20011018, 34 pp. DESIGNATED STATES: W: CN, KR, US; RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR. (Japanese). CODEN: PIXXD2. APPLICATION: WO 2001-JP2842 20010330. PRIORITY: JP 2000-103039 20000405.

AB The **batteries** have a nonaq. electrolyte soln., separators, Li **intercalating** cathodes, and Li **intercalating** anodes; where the anode active mass particles have a core of a 1st solid phase contg. Si, Sn, and/or Zn, a shell of a 2nd solid phase of a solid soln. or an intermetallic compd. of the 1st phase component and .gtoreq.1 of Si, Sn, Zn, and Group 2-14 elements other than C, with the 1st and/or 2nd phase being amorphous.

IT **12039-83-7**, Titanium silicide (TiSi2) **12166-63-1**
(anode active mass particles with intermetallic compd. or solid soln. shells for secondary lithium **batteries**)

RN 12039-83-7 HCAPLUS
CN Titanium silicide (TiSi2) (6CI, 8CI, 9CI) (CA INDEX NAME)



RN 12166-63-1 HCAPLUS
CN Tin, compd. with titanium (5:6) (6CI, 7CI, 8CI, 9CI) (CA INDEX

NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Ti | 6 | 7440-32-6 |
| Sn | 5 | 7440-31-5 |

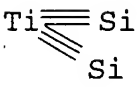
IC ICM H01M004-38
ICS H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST secondary lithium **battery** anode structure compn; core shell structure lithium **battery** anode mass; silicon anode active mass structure lithium **battery**; tin anode active mass structure lithium **battery**; zinc anode active mass structure lithium **battery**
IT **Battery** anodes
(anode active mass particles with intermetallic compd. or solid soln. shells for secondary lithium **batteries**)
IT 1313-08-2 11099-22-2 11109-57-2 11110-87-5 11124-13-3 11125-88-5 11143-56-9 11149-84-1 12017-12-8, Cobalt silicide (CoSi2) 12019-69-1 12023-01-7 **12039-83-7**, Titanium silicide (TiSi2) 12057-70-4 **12166-63-1** 12201-89-7, Nickel silicide (NiSi2) 12211-23-3 22831-39-6, Magnesium silicide (Mg2Si) 37230-21-0 71818-44-5 74946-92-2 141850-96-6 144692-49-9
(anode active mass particles with intermetallic compd. or solid soln. shells for secondary lithium **batteries**)
IT 7440-21-3, Silicon, uses
(silicon particles with intermetallic compd. or solid soln. shells for secondary lithium **battery** anodes)
IT 7440-31-5, Tin, uses
(tin particles with intermetallic compd. or solid soln. shells for secondary lithium **battery** anodes)
IT 7440-66-6, Zinc, uses
(zinc particles with intermetallic compd. or solid soln. shells for secondary lithium **battery** anodes)

L47 ANSWER 7 OF 36 HCAPLUS COPYRIGHT 2003 ACS
2001:677124 Document No. 135:213522 Secondary nonaqueous electrolyte **batteries**. Kasamatsu, Shinji; Shimamura, Harunari; Nitta, Yoshiaki (Matsushita Electric Industrial Co., Ltd., Japan). PCT Int. Appl. WO 2001067528 A1 20010913, 28 pp. DESIGNATED STATES: W: CN, KR, US; RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR. (Japanese). CODEN: PIXXD2. APPLICATION: WO 2001-JP1747 20010306. PRIORITY: JP 2000-61483 20000307; JP 2001-58323 20010302.
AB The **batteries** use anodes contg. graphite conductive particles, having median diam. Dc, and Li **intercalating** particles, having median diam. Da; where the Li **intercalating** particles have a Si and/or Sn core particle, coated with a solid soln. or intermetallic compd. layer contg. the

core component and .gtoreq.1 Group 2-14 element other than Si, Sn and C, and have Dc/Da = 0.02-0.5. Preferably, the coating is Ti2Si and Ti2Sn for Si and Sn cores, resp.

IT **12039-83-7**, Titanium silicide (TiSi2) **12510-35-9** **77137-25-8**, Titanium silicide (Ti2Si)
(anodes from lithium **intercalating** particles with solid soln. or intermetallic compd. coatings for secondary lithium **batteries**)

RN 12039-83-7 HCAPLUS
CN Titanium silicide (TiSi2) (6CI, 8CI, 9CI) (CA INDEX NAME)



RN 12510-35-9 HCAPLUS
CN Tin, compd. with titanium (1:2) (8CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Ti | 2 | 7440-32-6 |
| Sn | 1 | 7440-31-5 |

RN 77137-25-8 HCAPLUS
CN Titanium silicide (Ti2Si) (7CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Ti | 2 | 7440-32-6 |
| Si | 1 | 7440-21-3 |

IC ICM H01M004-38
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST secondary lithium **battery** anode particle coating; silicon particle intermetallic compd coating **battery** anode; tin particle intermetallic compd coating **battery** anode; size ratio **battery** anode active mass conductor

IT **Battery** anodes
(anodes from lithium **intercalating** particles with solid soln. or intermetallic compd. coatings for secondary lithium **batteries**)

IT Particle size
(controlled particle size ratio between graphite conductor and anode active mass in secondary lithium **batteries**)

IT 1313-08-2 7440-21-3, Silicon, uses 7440-31-5, Tin, uses **12039-83-7**, Titanium silicide (TiSi2) 12201-89-7, Nickel silicide (NiSi2) **12510-35-9** **77137-25-8**, Titanium silicide (Ti2Si)

(anodes from lithium **intercalating** particles with solid soln. or intermetallic compd. coatings for secondary lithium **batteries**)

IT 7782-42-5, Graphite, uses
(controlled particle size ratio between graphite conductor and anode active mass in secondary lithium **batteries**)

L47 ANSWER 8 OF 36 HCAPLUS COPYRIGHT 2003 ACS

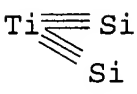
2001:564104 Document No. 135:139838 Nonaqueous electrolyte secondary **batteries** with excellent cycle characteristics. Nitta, Yoshiaki; Shimamura, Harunari; Kasamatsu, Shinji; Koshina, Shigeru (Matsushita Electric Industrial Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2001210323 A2 20010803, 9 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-16737 20000126.

AB The **battery** comprises a nonaq. electrolyte, a Li-**intercalating** cathode, and a Si-contg. Li-**intercalating** anode consisting of sintered composites of alloy particles, graphite particles, and carbonaceous particles and having certain pore vol.. The alloy particles in the anodes may esp. comprise Si-contg. cores having coatings of solid soln. or intermetallic compds. of Si with .gtoreq.1 element(s) selected from transition metals, Group 2, 12, 13, and 14 elements excluding carbon. Liq. junction in the cathode is maintained during expansion by **intercalation** of lithium.

IT **12039-83-7**, Titanium silicide (TiSi2)
(Si-cored particle surface; nonaq. electrolyte lithium secondary **batteries** with sintered composite anodes comprising carbonaceous particles, graphite particles, and silicon-cored intermetallic compd. or solid soln. particles)

RN 12039-83-7 HCAPLUS

CN Titanium silicide (TiSi2) (6CI, 8CI, 9CI) (CA INDEX NAME)




IC ICM H01M004-38
ICS H01M004-02; H01M004-62; H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST nonaq electrolyte lithium secondary **battery** anode; anode sintered composite silicon cored particle; graphite silicon cored particle sinter anode; carbonaceous silicon cored particle sinter anode

IT Secondary **batteries**
(lithium; nonaq. electrolyte lithium secondary **batteries** with sintered composite anodes comprising carbonaceous particles, graphite particles, and silicon-cored intermetallic compd. or solid soln. particles)

IT **Battery** anodes
(nonaq. electrolyte lithium secondary **batteries** with

sintered composite anodes comprising carbonaceous particles, graphite particles, and silicon-cored intermetallic compd. or solid soln. particles)

IT Carbonaceous materials (technological products)
(nonaq. electrolyte lithium secondary **batteries** with sintered composite anodes comprising carbonaceous particles, graphite particles, and silicon-cored intermetallic compd. or solid soln. particles)

IT 12017-12-8, Cobalt silicide (CoSi2) **12039-83-7**, Titanium silicide (TiSi2) 12201-89-7, Nickel silicide (NiSi2) 22831-39-6, Magnesium silicide (Mg2Si) 90157-90-7, Vanadium silicide (VSi3) 298700-26-2, Manganese silicide (MnSi1.8)
(Si-cored particle surface; nonaq. electrolyte lithium secondary **batteries** with sintered composite anodes comprising carbonaceous particles, graphite particles, and silicon-cored intermetallic compd. or solid soln. particles)

IT 7440-21-3, Silicon, uses
(particle core; nonaq. electrolyte lithium secondary **batteries** with sintered composite anodes comprising carbonaceous particles, graphite particles, and silicon-cored intermetallic compd. or solid soln. particles)

IT 7782-42-5, Graphite, uses
(particles; nonaq. electrolyte lithium secondary **batteries** with sintered composite anodes comprising carbonaceous particles, graphite particles, and silicon-cored intermetallic compd. or solid soln. particles)

L47 ANSWER 9 OF 36 HCAPLUS COPYRIGHT 2003 ACS

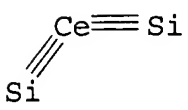
2001:388984 Document No. 135:7766 Silicon alloy or zinc alloy for anode of secondary nonaqueous electrolyte **battery** and its manufacture. Shimamura, Harunari; Nitta, Yoshiaki; Negi, Noriyuki; Uenaka, Hideya (Matsushita Electric Industrial Co., Ltd., Japan; Sumitomo Metal Industries, Ltd.). Jpn. Kokai Tokkyo Koho JP 2001148247 A2 20010529, 13 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1999-330096 19991119.

AB The alloy comprises A phase (core) contg. Si and/or Zn and B phase which surrounds at least part of the A phase. The B phase comprises intermetallic compds. or solid solns. of (a) Si and/or Zn and (b) .gtoreq.1 element selected from alk. earth metals, transition metals (Group IIIB to IIB elements), Group IIIA element, Group IVA element excluding C, and Group VA element. The alloy is manufd. by solidifying molten raw materials at solidification rate .gtoreq.100.degree./s and then immersing the obtained alloy in an acid soln. for removal of surface oxide layers. The alloy has high Li-**intercalation** capacity and shows suppressed vol. change during the **intercalation**, and the **battery** has high charge/discharge efficiency and long cycle life.

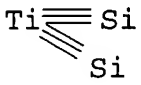
IT **12014-85-6P**, Cerium silicide (CeSi2) **12039-83-7P**, Titanium silicide (TiSi2) **12066-83-0P**, Praseodymium silicide (PrSi2) **12137-04-1P**, Neodymium silicide (NdSi2)
(B phase; quick solidification and oxide layer removal for manufg. Li-**intercalatable** Si- or Zi-alloy with

suppressed vol. change for nonaq. electrolyte **battery** anode)

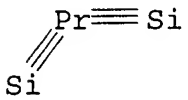
RN 12014-85-6 HCAPLUS
CN Cerium silicide (CeSi2) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



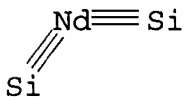
RN 12039-83-7 HCAPLUS
CN Titanium silicide (TiSi2) (6CI, 8CI, 9CI) (CA INDEX NAME)



RN 12066-83-0 HCAPLUS
CN Praseodymium silicide (PrSi2) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



RN 12137-04-1 HCAPLUS
CN Neodymium silicide (NdSi2) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



IT **39428-91-6P 341026-07-1P 341026-08-2P**
(quick solidification and oxide layer removal for manufg. Li-**intercalatable** Si- or Zi-alloy with suppressed vol. change for nonaq. electrolyte **battery** anode)
RN 39428-91-6 HCAPLUS
CN Silicon alloy, base, Si 56,Ti 44 (9CI) (CA INDEX NAME)

| Component | Component Percent | Component Registry Number |
|---|---|---|
| Si | 56 | 7440-21-3 |
| Ti | 44 | 7440-32-6 |

RN 341026-07-1 HCAPLUS

CN Praseodymium alloy, base, Pr 72,Si 28 (9CI) (CA INDEX NAME)

| Component | Component Percent | Component Registry Number |
|---|---|---|
| Pr | 72 | 7440-10-0 |
| Si | 28 | 7440-21-3 |

RN 341026-08-2 HCAPLUS
CN Cerium alloy, base, Ce 69,Si 31 (9CI) (CA INDEX NAME)

| Component | Component Percent | Component Registry Number |
|---|---|---|
| Ce | 69 | 7440-45-1 |
| Si | 31 | 7440-21-3 |

IC ICM H01M004-38
ICS H01M004-02; H01M004-04; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56
ST silicon alloy anode lithium **intercalation** nonaq electrolyte **battery**; zinc alloy anode lithium **intercalation** nonaq electrolyte **battery**; oxide layer removal alloy anode nonaq electrolyte **battery**
IT **Battery** anodes
(quick solidification and oxide layer removal for manufg. Li-**intercalatable** Si- or Zi-alloy with suppressed vol. change for nonaq. electrolyte **battery** anode)
IT 7440-21-3P, Silicon, uses 7440-66-6P, Zinc, uses
(A phase; quick solidification and oxide layer removal for manufg. Li-**intercalatable** Si- or Zi-alloy with suppressed vol. change for nonaq. electrolyte **battery** anode)
IT 11133-86-1P 12013-56-8P, CaSi2 **12014-85-6P**, Cerium silicide (CeSi2) 12017-12-8P, Cobalt silicide (CoSi2) 12018-09-6P, Chromium silicide (CrSi2) 12022-99-0P, Iron silicide (FeSi2) 12035-57-3P, NiSi **12039-83-7P**, Titanium silicide (TiSi2) 12039-87-1P, Vanadium silicide (VSi2) 12039-88-2P, Tungsten silicide (WSi2) **12066-83-0P**, Praseodymium silicide (PrSi2) **12137-04-1P**, Neodymium silicide (NdSi2) 12201-89-7P, Nickel silicide (NiSi2) 12293-65-1P, Manganese silicide (Mn4Si7) 12621-78-2P 12635-57-3P 53095-77-5P, Magnesium silicide (MgSi2) 55350-61-3P 69623-51-4P 96755-45-2P 117615-38-0P, Copper silicide (CuSi2) 123188-80-7P, MgZn11 341026-25-3P
(B phase; quick solidification and oxide layer removal for manufg. Li-**intercalatable** Si- or Zi-alloy with suppressed vol. change for nonaq. electrolyte **battery** anode)
IT **39428-91-6P** 42611-25-6P 54134-24-6P 58923-90-3P 69030-03-1P 76918-47-3P 107614-61-9P 117937-72-1P

123460-31-1P 129677-38-9P 131437-93-9P 169217-08-7P
217196-42-4P 332387-65-2P 341026-05-9P 341026-06-0P
**341026-07-1P 341026-08-2P** 341026-09-3P
341026-10-6P 341026-11-7P 341026-12-8P 341026-13-9P
341026-14-0P 341026-15-1P 341026-16-2P
(quick solidification and oxide layer removal for manufg. Li-**intercalatable** Si- or Zi-alloy with suppressed vol. change for nonaq. electrolyte **battery** anode)

IT 7647-01-0, Hydrochloric acid, uses 7664-39-3, Hydrogen fluoride, uses 7697-37-2, Nitric acid, uses
(quick solidification and oxide layer removal for manufg. Li-**intercalatable** Si- or Zi-alloy with suppressed vol. change for nonaq. electrolyte **battery** anode)

L47 ANSWER 10 OF 36 HCAPLUS COPYRIGHT 2003 ACS
2001:377174 Document No. 134:355494 Secondary nonaqueous electrolyte **batteries**. Kajiura, Hisashi; Yamaura, Kiyoshi (Sony Corp., Japan). Jpn. Kokai Tokkyo Koho JP 2001143699 A2 20010525, 9 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1999-325937 19991116.

AB The **batteries** have Li **intercalating** electrodes and nonaq. electrolyte soln., where the anode active mass contains .gtoreq.1 Li alloying element, having Young's modulus 5-45 GPa, and element(s) hard to form Li alloy.

IT **60688-49-5**
(anodes contg. lithium alloying metal with controlled young's modulus and non-alloying metal for secondary lithium **batteries**)

RN 60688-49-5 HCAPLUS
CN Indium, compd. with titanium (4:3) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| In | 4 | 7440-74-6 |
| Ti | 3 | 7440-32-6 |

IC ICM H01M004-38
ICS H01M004-02; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST secondary lithium **battery** anode compn; lithium alloying metal modulus secondary **battery** anode
IT **Battery** anodes
Young's modulus
(anodes contg. lithium alloying metal with controlled young's modulus and non-alloying metal for secondary lithium **batteries**)
IT 7439-93-2, Lithium, uses 7440-32-6, Titanium, uses 7440-74-6, Indium, uses **60688-49-5**
(anodes contg. lithium alloying metal with controlled young's modulus and non-alloying metal for secondary lithium **batteries**)

L47 ANSWER 11 OF 36 HCAPLUS COPYRIGHT 2003 ACS
2001:110094 Document No. 134:138389 Method for plutonium-gallium separation by anodic dissolution of a solid plutonium-gallium alloy. Miller, William E.; Tomczuk, Zygmunt (The United States of America as Represented by the United States Department, USA). U.S. US 6187163 B1 20010213, 8 pp. (English). CODEN: USXXAM. APPLICATION: US 1998-206959 19981208.

AB Purified plutonium and gallium are efficiently recovered from a solid plutonium-gallium (Pu--Ga) alloy by using an electrorefining process. The solid Pu-Ga alloy is the cell anode, preferably placed in a moving basket within the electrolyte. As the surface of the Pu-Ga anode is depleted in plutonium by the electrotransport of the plutonium to a cathode, the temp. of the electrolyte is sufficient to liquefy the surface, preferably at about 500.degree. C., resulting in a liq. anode layer substantially comprised of gallium. The gallium drips from the liquefied surface and is collected below the anode within the **electrochem. cell**. The transported plutonium is collected on the cathode surface and is recovered.

IT **57854-10-1**
(plutonium-gallium sepn. by anodic dissoln. of solid plutonium-gallium alloy)

RN 57854-10-1 HCAPLUS

CN Gallium alloy, nonbase, Ga,Pu (9CI) (CA INDEX NAME)

| Component | Component Registry Number |
|---|---|
| Ga | 7440-55-3 |
| Pu | 7440-07-5 |

IC ICM C25C001-22
ICS C25C003-34

NCL 205044000

CC 72-8 (Electrochemistry)
Section cross-reference(s): 56, 71

IT Electric potential
**Electrolytic cells**
(for plutonium-gallium sepn. by anodic dissoln. of a solid plutonium-gallium alloy in molten salt electrolyte)

IT **Oxidizing** agents
(plutonium-gallium sepn. by anodic dissoln. of a solid plutonium-gallium alloy in KCl-LiCl melt contg.)

IT **57854-10-1**
(plutonium-gallium sepn. by anodic dissoln. of solid plutonium-gallium alloy)

L47 ANSWER 12 OF 36 HCAPLUS COPYRIGHT 2003 ACS
2000:911597 Document No. 134:59131 Performance enhancing additives for **batteries**. Jin, Zhihong; Kennedy, John H. (Eveready Battery Company, Inc., USA). PCT Int. Appl. WO 2000079622 A1 20001228, 32 pp. DESIGNATED STATES: W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR,

BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG. (English). CODEN: PIXXD2.
APPLICATION: WO 2000-US17561 20000621. PRIORITY: US 1999-PV140590 19990623; US 2000-PV212295 20000617.

AB Alk. **battery** cells comprising an **anode**, a cathode, a separator between the **anode** and the cathode, and an electrolyte are provided with an n-type metal oxide additive that improves electrochem. performance. The n-type metal oxide additive is either a doped metal oxide comprising a metal oxide modified by incorporation of a dopant, or a reduced metal oxide. The metal oxide may be selected from the group consisting of $BaTiO_3$, $K_2TiO_3$, $CoTiO_3$, $SrTiO_3$, $CaTiO_3$, $MgTiO_3$, $SiO_2$, CaO, $TiO_2$, CoO, $Co_3O_4$, ZnO, SnO, $SnO_2$, $PbO_2$, $Bi_2O_3$, $Bi_2O_3.3ZrO_3$, $Bi_{12}TiO_{20}$, $Fe_2O_3$-$TiO_2$, $Nb_2O_5$, $CaWO_4$, $ZnMn_2O_4$, and $K_2Cr_2O_7$. Examples of dopant disclosed are: $NbO_2$, $Nb_2O_5$, $Ta_2O_5$, $WO_3$, $GeO_2$, $ZrO_2$, $SnO_2$, $ThO_2$, $Fe_2O_3$, $In_2O_3$, $LiNiO_2$, and $P_2O_5$, $In_2O_3$, $Sb_2O_5$.

IT **12048-52-1**, Bismuth zirconium oxide $Bi_2Zr_3O_9$
**12441-73-5**, Bismuth titanium oxide $Bi_{12}TiO_{20}$
(performance enhancing additives for **batteries**)

RN 12048-52-1 HCAPLUS
CN Bismuth zirconium oxide ($Bi_2Zr_3O_9$) (8CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 9 | 17778-80-2 |
| Bi | 2 | 7440-69-9 |
| Zr | 3 | 7440-67-7 |

RN 12441-73-5 HCAPLUS
CN Bismuth titanium oxide ($Bi_{12}TiO_{20}$) (8CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 20 | 17778-80-2 |
| Bi | 12 | 7440-69-9 |
| Ti | 1 | 7440-32-6 |

IC ICM H01M004-62
ICS H01M006-16
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST **battery** performance enhancing additive metal oxide
IT **Battery anodes**
**Battery** cathodes
Primary **batteries**
(performance enhancing additives for **batteries**)

IT Oxides (inorganic), uses
(performance enhancing additives for **batteries**)
IT 1313-13-9, Manganese dioxide, uses
(performance enhancing additives for **batteries**)
IT 1304-76-3, Bismuth oxide bi2o3, uses 1305-78-8, Calcia, uses 1307-96-6, Cobalt oxide coo, uses 1308-06-1, Cobalt oxide co3o4 1309-60-0, Lead dioxide 1313-96-8, Niobia 1314-13-2, Zinc oxide zno, uses 7631-86-9, Silica, uses 7778-50-9, Potassium dichromate 7790-75-2, Calcium tungstate cawo4 12017-01-5, Cobalt titanium oxide cotio3 12023-27-7, Iron titanium oxide (Fe2TiO5) 12030-97-6, Potassium titanium oxide k2tio3 12032-30-3, Magnesium titanium oxide mgtio3 12032-94-9, Zinc manganese oxide ZnMn2O4 12047-27-7, Barium titanium oxide batio3, uses **12048-52-1**, Bismuth zirconium oxide Bi2Zr3O9 12049-50-2, Calcium titanium oxide catio3 12060-59-2, Strontium titanium oxide srtio3 **12441-73-5**, Bismuth titanium oxide Bi12TiO20 13463-67-7, Titania, uses 18282-10-5, Tin dioxide 21651-19-4, Tin oxide sno
(performance enhancing additives for **batteries**)
IT 1309-37-1, Ferric oxide, uses 1310-53-8, Germania, uses 1310-58-3, Potassium hydroxide (K(OH)), uses 1312-43-2, Indium oxide in2o3 1314-20-1, Thoria, uses 1314-23-4, Zirconia, uses 1314-35-8, Tungsten trioxide, uses 1314-56-3, Phosphorus pentoxide, uses 1314-61-0, Tantalum pentoxide 7440-66-6, Zinc, uses 12031-65-1, **Lithium** nickel oxide linio2
(performance enhancing additives for **batteries**)

L47 ANSWER 13 OF 36 HCAPLUS COPYRIGHT 2003 ACS
2000:852884 Document No. 134:103950 Emerging applications of intermetallics. Stoloff, N. S.; Liu, C. T.; Deevi, S. C. (Department of Materials Science and Engineering, Rensselaer Polytechnic Institute, Troy, NY, 12180-3590, USA). Intermetallics, 8(9-11), 1313-1320 (English) 2000. CODEN: IERME5. ISSN: 0966-9795. Publisher: Elsevier Science Ltd..
AB A review, with 36 refs. Many intermetallic compds. display an attractive combination of phys. and mech. properties, including high m.p., low d. and good **oxidn.** or corrosion resistance. This has led to their utilization in many non-structural applications, but success in structural applications has, to date, been limited. This paper reviews the current status of intermetallic applications, with emphasis on new uses that are in place or pending. Most of the paper deals with aluminides and silicides, but there are several more complex intermetallics that are being employed in **battery** and magnetic applications. Research on improved processing and studies of the role of environment in mech. behavior are key to developing practical alloys.
IT **12003-96-2 12003-98-4**
(emerging applications of intermetallics)
RN 12003-96-2 HCAPLUS
CN Aluminum, compd. with titanium (1:1) (8CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component |
|---|---|---|

| | | Registry Number |
|---|---|---|
| Ti | 1 | 7440-32-6 |
| Al | 1 | 7429-90-5 |

RN 12003-98-4 HCAPLUS
CN Aluminum, compd. with titanium (1:3) (6CI, 8CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Ti | 3 | 7440-32-6 |
| Al | 1 | 7429-90-5 |

CC 56-0 (Nonferrous Metals and Alloys)
IT Corrosion-resistant materials
Mechanical properties
Primary **batteries**
(emerging applications of intermetallics)
IT 12003-42-8, Iron aluminide Fe3Al 12003-75-7 **12003-96-2** **12003-98-4** 12018-17-6 12018-36-9, Chromium silicide (Cr3Si) 12035-03-9, Niobium silicide (Nb3Si) 12042-17-0, Iron aluminide FeAl 12060-34-3, Niobium silicide (Nb5Si3) 12201-89-7, Nickel silicide (NiSi2)
(emerging applications of intermetallics)

L47 ANSWER 14 OF 36 HCAPLUS COPYRIGHT 2003 ACS
2000:358451 Document No. 133:20024 Study of the reaction of lithium with isostructural A2B and various AlxB alloys. Larcher, D.; Beaulieu, L. Y.; Mao, O.; George, A. E.; Dahn, J. R. (Department of Physics, Dalhousie University, Halifax, NS, B3H 3J5, Can.). Journal of the Electrochemical Society, 147(5), 1703-1708 (English) 2000. CODEN: JESOAN. ISSN: 0013-4651. Publisher: Electrochemical Society.
AB The electrochem. alloying reaction of Li with isostructural A2B and Al-based alloys has been investigated. The binary A2B alloys we selected (Sb2Ti, Sb2V, Sn2Co, Sn2Mn, Sn2Fe, Al2Cu, and Ge2Fe) are isostructural (Al2Cu type) and comprise an active element (A) that alloys with lithium, and an inactive one (B) that does not. These compds. were prepd. by mech. alloying and have small grain size (10-20 nm). With the exception of Al2Cu, we obsd. a full reaction of A with lithium (A2B + 2xLi .fwdarw. B + 2LixA, where the theor. values of x are 1 for Al, 3 for Sb, and 4.4 for Si, Ge, and Sn). Extremely slow electrochem. cycling at 55.degree. and potentiostatic tests at lithium potential proved the total inactivity of the Al2Cu vs. lithium. However, thermodn. considerations predict that the reaction of Al2Cu with Li should occur and that the formation of LiAl should be obsd. Other Al-transition metal intermetallics were studied and were also found to be inert toward Li, suggesting that the Al-transition metal bond has unique features.
IT **12786-81-1**

(reaction of lithium with isostructural A2B and various AlxB alloys)
RN 12786-81-1 HCAPLUS
CN Antimony, compd. with titanium (2:1) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Sb | 2 | 7440-36-0 |
| Ti | 1 | 7440-32-6 |

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56
ST **battery** anode lithium interaction alloy; intermetallic isostructural lithium interaction **battery** anode
IT Alloying
**Intercalation**
(electrochem.; reaction of lithium with isostructural A2B and various AlxB alloys)
IT Secondary **batteries**
(lithium; reaction of lithium with isostructural A2B and various AlxB alloys)
IT **Battery** anodes
Crystallography
Grain size
Mechanical alloying
(reaction of lithium with isostructural A2B and various AlxB alloys)
IT 12004-15-8 12023-01-7 12032-87-0 12062-74-7 12394-61-5
**12786-81-1** 12786-82-2
(reaction of lithium with isostructural A2B and various AlxB alloys)

L47 ANSWER 15 OF 36 HCAPLUS COPYRIGHT 2003 ACS
2000:278210 Document No. 132:281689 Secondary nonaqueous electrolyte **batteries**. Bito, Yasuhiko; Sato, Toshitada; Matsuda, Hiromu; Toyoguchi, Yoshinori; Nakagiri, Yasushi; Takezawa, Hideharu (Matsushita Electric Industrial Co., Ltd., Japan). PCT Int. Appl. WO 2000024070 A1 20000427, 36 pp. DESIGNATED STATES: W: US; RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE. (Japanese). CODEN: PIXXD2. APPLICATION: WO 1999-JP5805 19991020. PRIORITY: JP 1998-300547 19981022; JP 1998-302466 19981023; JP 1999-244061 19990830; JP 1999-246273 19990831; JP 1999-270703 19990924.
AB The **batteries** use anodes contg. LixMaM' (M = Ti, Zr, V, Sr, Ba, Y, La, Cr, Mo, W, Mn, Co, Ir, Ni, Cu and/or Fe; M' = Mg, Ca, Al, In, Si, Sn, Pb, Sb, and/or Bi; M .noteq.M'; x .ltoreq.10; 0.1 .ltoreq.a .ltoreq.10)alloy particles that contain .gtoreq.2 phases. The 2 phases are McM' with 0.25 .ltoreq.c .ltoreq.3 and MdM' with 1 .ltoreq.d .ltoreq.10 and c <d.
IT **11130-80-6 12003-64-4 12003-96-2**
**12004-32-9 12004-78-3 12039-70-2,**

US 6265111

Titanium silicide (TiSi) **12039-83-7**, Titanium silicide (TiSi2) **12039-90-6**, Zirconium silicide (ZrSi2) **12067-57-1**, Titanium silicide (Ti5Si3) **12138-26-0**, Zirconium silicide (ZrSi) **12138-32-8 12166-59-5 12166-60-8 12166-63-1 12413-12-6 12510-35-9 77137-25-8**, Titanium silicide (Ti2Si) **93508-85-1 210885-32-8 264124-72-3 264124-80-3 264124-90-5**, Zirconium silicide (Zr0.8Si)
(compns. of multiphase lithium **intercalating** alloys for anodes in secondary lithium **batteries**)

RN 11130-80-6 HCAPLUS
CN Aluminum, compd. with lanthanum (2:3) (6CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| La | 3 | 7439-91-0 |
| Al | 2 | 7429-90-5 |

RN 12003-64-4 HCAPLUS
CN Aluminum, compd. with lanthanum (1:1) (8CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| La | 1 | 7439-91-0 |
| Al | 1 | 7429-90-5 |

RN 12003-96-2 HCAPLUS
CN Aluminum, compd. with titanium (1:1) (8CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Ti | 1 | 7440-32-6 |
| Al | 1 | 7429-90-5 |

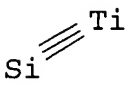
RN 12004-32-9 HCAPLUS
CN Aluminum, compd. with lanthanum (2:1) (6CI, 8CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| La | 1 | 7439-91-0 |
| Al | 2 | 7429-90-5 |

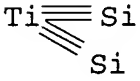
RN 12004-78-3 HCAPLUS
CN Aluminum, compd. with titanium (3:1) (6CI, 8CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Ti | 1 | 7440-32-6 |
| Al | 3 | 7429-90-5 |

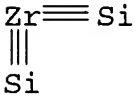
RN 12039-70-2 HCAPLUS
CN Titanium silicide (TiSi) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



RN 12039-83-7 HCAPLUS
CN Titanium silicide (TiSi2) (6CI, 8CI, 9CI) (CA INDEX NAME)



RN 12039-90-6 HCAPLUS
CN Zirconium silicide (ZrSi2) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



RN 12067-57-1 HCAPLUS
CN Titanium silicide (Ti5Si3) (6CI, 8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
RN 12138-26-0 HCAPLUS
CN Zirconium silicide (ZrSi) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

RN 12138-32-8 HCAPLUS
CN Tin, compd. with zirconium (1:1) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|

| | | |
|---|---|---|
| Zr | 1 | 7440-67-7 |
| Sn | 1 | 7440-31-5 |

RN 12166-59-5 HCAPLUS
CN Tin, compd. with titanium (1:3) (8CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Ti | 3 | 7440-32-6 |
| Sn | 1 | 7440-31-5 |

RN 12166-60-8 HCAPLUS
CN Tin, compd. with zirconium (2:1) (8CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Zr | 1 | 7440-67-7 |
| Sn | 2 | 7440-31-5 |

RN 12166-63-1 HCAPLUS
CN Tin, compd. with titanium (5:6) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Ti | 6 | 7440-32-6 |
| Sn | 5 | 7440-31-5 |

RN 12413-12-6 HCAPLUS
CN Tin, compd. with zirconium (1:4) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Zr | 4 | 7440-67-7 |
| Sn | 1 | 7440-31-5 |

RN 12510-35-9 HCAPLUS
CN Tin, compd. with titanium (1:2) (8CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Ti | 2 | 7440-32-6 |
| Sn | 1 | 7440-31-5 |

RN 77137-25-8 HCAPLUS
CN Titanium silicide (Ti2Si) (7CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Ti | 2 | 7440-32-6 |
| Si | 1 | 7440-21-3 |

RN 93508-85-1 HCAPLUS
CN Lanthanum, compd. with tin (1:2) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Sn | 2 | 7440-31-5 |
| La | 1 | 7439-91-0 |

RN 210885-32-8 HCAPLUS
CN Tin, compd. with titanium (1:1) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Ti | 1 | 7440-32-6 |
| Sn | 1 | 7440-31-5 |

RN 264124-72-3 HCAPLUS
CN Tin, compd. with titanium (2:3) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Ti | 3 | 7440-32-6 |
| Sn | 2 | 7440-31-5 |

RN 264124-80-3 HCAPLUS
CN Tin, compd. with titanium (1:1.8) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Ti | 1.8 | 7440-32-6 |
| Sn | 1 | 7440-31-5 |

RN 264124-90-5 HCAPLUS
CN Zirconium silicide (Zr0.8Si) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Zr | 0.8 | 7440-67-7 |
| Si | 1 | 7440-21-3 |

IC ICM H01M004-40
ICS H01M004-02; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST **battery** anode lithium alloy compn
IT **Battery** anodes
(compns. of multiphase lithium **intercalating** alloys for anodes in secondary lithium **batteries**)
IT 1310-52-7 1313-08-2 7429-90-5, Aluminum, uses 7439-89-6, Iron, uses 7439-95-4, Magnesium, uses 7439-96-5, Manganese, uses 7439-98-7, Molybdenum, uses 7440-02-0, Nickel, uses 7440-21-3, Silicon, uses 7440-31-5, Tin, uses 7440-33-7, Tungsten, uses 7440-48-4, Cobalt, uses 7440-50-8, Copper, uses 7440-62-2, Vanadium, uses **11130-80-6** 12003-14-4 12003-21-3 12003-42-8 **12003-64-4** 12003-70-2 **12003-96-2** 12004-15-8 **12004-32-9** 12004-58-9 12004-62-5 **12004-78-3** 12009-35-7, Barium silicide (BaSi) 12017-11-7, Cobalt silicide (CoSi) 12017-12-8, Cobalt silicide (CoSi2) 12019-61-3 12019-69-1 12022-95-6, Iron silicide (FeSi) 12022-99-0, Iron silicide (FeSi2) 12023-00-6 12023-54-0, Iron silicide (Fe3Si) 12023-56-2 12023-77-7, Iron silicide (Fe5Si3) 12032-85-8, Manganese silicide (MnSi) 12032-86-9, Manganese silicide (MnSi2) 12032-87-0 12033-06-6 12033-10-2, Manganese silicide (Mn5Si3) 12033-37-3, Molybdenum silicide (Mo3Si) 12035-57-3, Nickel silicide (NiSi) **12039-70-2**, Titanium silicide (TiSi) 12039-75-7, Vanadium silicide (VSi) 12039-76-8, Vanadium silicide (V3Si) **12039-83-7**, Titanium silicide (TiSi2) 12039-87-1, Vanadium silicide (VSi2) **12039-90-6**, Zirconium silicide (ZrSi2) 12042-17-0 12054-11-4 12059-11-9 12059-14-2, Nickel silicide (Ni2Si) 12059-23-3 12059-24-4 **12067-57-1**, Titanium silicide (Ti5Si3) 12136-73-1, Manganese silicide (Mn2Si) 12138-25-9, Vanadium silicide (V2Si) **12138-26-0**, Zirconium silicide (ZrSi) **12138-32-8** 12163-59-6, Manganese silicide (Mn3Si) **12166-59-5** **12166-60-8** **12166-63-1** 12201-89-7, Nickel silicide (NiSi2) 12202-01-6 12252-30-1 12253-13-3 12253-45-1 12297-65-3 12339-84-3 12343-95-2, Iron silicide (Fe2Si) 12394-61-5 12396-85-9, Nickel silicide (Ni3Si2) 12410-47-8, Cobalt silicide (Co3Si) **12413-12-6** **12510-35-9** 12629-48-0 12725-82-5 12763-92-7 39438-57-8, Iron silicide (Fe3Si2) 39445-33-5 54065-12-2 60874-28-4, Iron molybdenum silicide (FeMoSi) **77137-25-8**, Titanium silicide (Ti2Si) 78983-55-8 86116-27-0 91607-16-8 **93508-85-1** 141616-89-9 **210885-32-8** 264124-69-8 264124-70-1 264124-71-2 **264124-72-3** 264124-74-5 264124-75-6 264124-76-7 264124-77-8 264124-79-0 **264124-80-3** 264124-81-4 264124-82-5 **264124-90-5**, Zirconium silicide (Zr0.8Si) 264124-96-1, Vanadium silicide (V3Si2) 264125-08-8, Cobalt silicide (Co3Si2) 264125-13-5, Barium titanium silicide (BaTi2Si2) 264125-17-9 264125-18-0
(compns. of multiphase lithium **intercalating** alloys for anodes in secondary lithium **batteries**)

L47 ANSWER 16 OF 36 HCAPLUS COPYRIGHT 2003 ACS
2000:133007 Document No. 132:183100 Secondary **nonaqueous batteries** containing corundum-structure metal oxides.
Igawa, Akiko; Tsuruoka, Shigeo; Muranaka, Yasushi; Kasai, Masahiro (Hitachi, Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2000058036 A2 20000225, 7 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1998-224033 19980807.

AB Claimed **batteries** comprise M2O3 (M = Ti, Al, V, Fe, and/or Cr) having R3c-type corundum-structure and showing phase transformation at 100-220.degree. for large drop of electrocond. in cathodes, **anodes**, separators, and/or terminals. The **batteries** have high safety in overcharging, breakage, fire, etc. and are suitable for various elec. appliances.

IT **259255-84-0**, Aluminum titanium oxide (Al1.6Ti0.4O3)
(**lithium batteries** contg. corundum-structure transition metal oxides for safety)

RN 259255-84-0 HCAPLUS
CN Aluminum titanium oxide (Al1.6Ti0.4O3) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 3 | 17778-80-2 |
| Ti | 0.4 | 7440-32-6 |
| Al | 1.6 | 7429-90-5 |

IC ICM H01M002-34
ICS H01M004-62; H01M010-40; H01M010-42

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST titanium oxide corundum structure **battery** safety; aluminum oxide corúndum structure **lithium battery**; vanadium oxide corundum structure **lithium battery** ; iron oxide corundum structure **lithium battery**; chromium oxide corundum structure **lithium battery**

IT Safety
(**lithium batteries** contg. corundum-structure transition metal oxides for safety)

IT Secondary **batteries**
(**lithium**; **lithium batteries** contg. corundum-structure transition metal oxides for safety)

IT 1309-37-1, Ferric oxide, uses 1314-34-7, Vanadium oxide V2O3 1344-28-1, Alumina, uses 1344-54-3, Titanium oxide Ti2O3 12279-81-1, Aluminum chromium oxide (Al8Cr2O15) 120604-88-8, Chromium iron oxide (Cr0.4Fe1.6O3) 137511-66-1, Chromium vanadium oxide (Cr1.6V0.4O3) 138933-47-8, Chromium vanadium oxide (Cr0.4V1.6O3) 155653-50-2, Titanium vanadium oxide (Ti0.4V1.6O3) 172664-46-9, Chromium titanium oxide (Cr1.6Ti0.4O3) 259255-83-9, Chromium titanium oxide (Cr0.4Ti1.6O3) **259255-84-0**, Aluminum titanium oxide (Al1.6Ti0.4O3) 259255-86-2, Iron titanium oxide (Fe1.6Ti0.4O3) 259255-87-3, Aluminum vanadium oxide (Al1.6V0.4O3) 259255-88-4, Titanium vanadium oxide (Ti1.6V0.4O3) 259255-90-8, Iron vanadium oxide (Fe1.6V0.4O3)

(**lithium batteries** contg. corundum-structure transition metal oxides for safety)

L47 ANSWER 17 OF 36 HCAPLUS COPYRIGHT 2003 ACS
1999:818897 Document No. 132:38163 Rechargeable **lithium battery anode** comprising a solid solution of titanium dioxide and tin dioxide. Jacobs, James K.; Dasgupta, Sankar (Electrofuel Inc., Can.). U.S. US 6007945 A 19991228, 5 pp. (English). CODEN: USXXAM. APPLICATION: US 1997-949099 19971010. PRIORITY: US 1996-28473 19961015.

AB Solid soln. of titanium dioxide and tin dioxide is utilized as the **anode** active substance in the **anode** of a rechargeable **lithium battery**. The **lithium battery** comprised of an **anode** contg. particles of titanium dioxide-tin dioxide solid soln., a **nonaq. lithium** ion bearing electrolyte and a cathode, usually made of a **lithium** contg. chalcogenide compd. provides stable voltage, has high reversible **anode** capacity and high energy d.

IT **117655-95-5**, Tin titanium oxide (Sn0.35Ti0.65O2)
**139920-08-4**, Tin titanium oxide **252557-87-2**, Tin titanium oxide (Sn0.45Ti0.55O2)
(rechargeable **lithium battery anode** comprising a solid soln. of titania and tin dioxide)

RN 117655-95-5 HCAPLUS
CN Tin titanium oxide (Sn0.35Ti0.65O2) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 2 | 17778-80-2 |
| Ti | 0.65 | 7440-32-6 |
| Sn | 0.35 | 7440-31-5 |

RN 139920-08-4 HCAPLUS
CN Tin titanium oxide (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | x | 17778-80-2 |
| Ti | x | 7440-32-6 |
| Sn | x | 7440-31-5 |

RN 252557-87-2 HCAPLUS
CN Tin titanium oxide (Sn0.45Ti0.55O2) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 2 | 17778-80-2 |
| Ti | 0.55 | 7440-32-6 |

| Sn | 0.45 | 7440-31-5 |
|---|---|---|

IC ICM H01M004-48
NCL 429218100
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST **lithium battery anode** titania tin dioxide
IT Transition metal chalcogenides
(**lithiated**, cathodes; rechargeable **lithium battery anode** comprising a solid soln. of titania and tin dioxide)
IT Secondary **batteries**
(**lithium**; rechargeable **lithium battery anode** comprising a solid soln. of titania and tin dioxide)
IT **Battery anodes**
(rechargeable **lithium battery anode** comprising a solid soln. of titania and tin dioxide)
IT 11126-15-1, **Lithium** vanadium oxide 39300-70-4, **Lithium** nickel oxide 39457-42-6, **Lithium** manganese oxide 52627-24-4, Cobalt **lithium** oxide **117655-95-5**, Tin titanium oxide (Sn0.35Ti0.6502) **139920-08-4**, Tin titanium oxide **252557-87-2**, Tin titanium oxide (Sn0.45Ti0.5502)
(rechargeable **lithium battery anode** comprising a solid soln. of titania and tin dioxide)
IT 7440-44-0, Carbon, uses
(rechargeable **lithium battery anode** comprising a solid soln. of titania and tin dioxide)

L47 ANSWER 18 OF 36 HCAPLUS COPYRIGHT 2003 ACS
1999:789605 Document No. 132:26224 Apparatus and method for oxidative decomposition of noxious hydrocarbons in waste gases by using solid electrolytes. Yamamura, Hiroshi; Tadenuma, Katsuyoshi (Kaneko Kenzai K. K., Japan; Kaken K. K.). Jpn. Kokai Tokkyo Koho JP 11342312 A2 19991214 Heisei, 16 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1998-150116 19980529.
AB The app. comprises means for applying d.c. voltage to the planar solid electrolytes of an **electrolysis cell** to form active oxygen radicals from **anode** surface, and means for decompg. noxious hydrocarbons into CO2 and H2O in treated gases passing through the cell. The solid electrolytes are preferably composite metal oxides of formula: Ce1-y(Sm1-xMx)yO2-xy-y/2 (M = **Li**, Na, and/or K; x = 0-1, yr = 0-1), or Zr1-y(Y1-xMx)yO2-xy-y/2 (M = **Li**, Na, and K; x = 0-1, y = 0-1).
IT **116875-84-4**, Cerium samarium oxide (Ce0.8Sm0.2O1.9)
(solid electrolyte; app. and method for oxidative decompn. of noxious hydrocarbons in waste gases by using solid electrolytes)
RN 116875-84-4 HCAPLUS
CN Cerium samarium oxide (Ce0.8Sm0.2O1.9) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 1.9 | 17778-80-2 |
| Ce | 0.8 | 7440-45-1 |
| Sm | 0.2 | 7440-19-9 |

IC ICM B01D053-32
ICS B01D053-34; B01D053-72; B01D053-70
CC 59-4 (Air Pollution and Industrial Hygiene)
IT 107069-36-3, Yttrium zirconium oxide (Y0.2Zr0.8O1.9)
**116875-84-4**, Cerium samarium oxide (Ce0.8Sm0.2O1.9)
252054-97-0, **Lithium** yttrium zirconium oxide (Li0.02Y0.18Zr0.8O1.88) 252054-98-1, **Lithium** yttrium zirconium oxide (Li0.06Y0.1Zr0.8O1.84) 252054-99-2, Cerium samarium sodium oxide (Ce0.8Sm0.18Na0.15O1.9) 252055-00-8, Cerium samarium sodium oxide (Ce0.8Sm0.14Na0.06O1.84) 252055-02-0, Cerium samarium sodium oxide (Ce0.8Sm0.11Na0.09O1.81)
(solid electrolyte; app. and method for oxidative decompn. of noxious hydrocarbons in waste gases by using solid electrolytes)

L47 ANSWER 19 OF 36 HCAPLUS COPYRIGHT 2003 ACS
1999:260952 Document No. 130:314436 Organic electrolyte secondary **batteries** with **lithium** mixed oxide **anodes**
. Shinoda, Naoki (Hitachi Maxell, Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 11111293 A2 19990423 Heisei, 7 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1997-291592 19971007.
AB The ~~anode active~~ materials have compn. formula LixMyTi1-yO2-y (M = Si, Ge, Sn, and/or Pb; x = 0-6; y = 0.5-1) and ~~optionally contain~~ **Li**, and give rutile TiO2 peak in x-ray diffractometry. The **batteries** show excellent cycle characteristics and have high capacity.
IT **12060-00-3P**, Lead titanium oxide (PbTiO3)
**12340-09-9P**, Tin titanium oxide (SnTiO3)
(titanium mixed oxides contg. rutile as **anode** active materials in org. electrolyte secondary **batteries**)
RN 12060-00-3 HCAPLUS
CN Lead titanium oxide (PbTiO3) (8CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 3 | 17778-80-2 |
| Ti | 1 | 7440-32-6 |
| Pb | 1 | 7439-92-1 |

RN 12340-09-9 HCAPLUS
CN Tin titanium oxide (SnTiO3) (8CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|

| | | |
|---|---|---|
| O | 3 | 17778-80-2 |
| Ti | 1 | 7440-32-6 |
| Sn | 1 | 7440-31-5 |

IC ICM H01M004-58
ICS H01M004-02; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST **lithium nonaq** secondary **battery** cathode; silicon titanium oxide **battery anode**; germanium titanium oxide **battery anode**; rutile contg oxide **battery anode**; tin titanium oxide **battery anode**; lead titanium oxide **battery anode**
IT Secondary **batteries**
(org. electrolyte; titanium mixed oxides contg. rutile as **anode** active materials in org. electrolyte secondary **batteries**)
IT **Battery anodes**
(titanium mixed oxides contg. rutile as **anode** active materials in org. electrolyte secondary **batteries**)
IT 7439-93-2P, **Lithium**, uses
(**anodes** contg.; titanium mixed oxides contg. rutile as **anode** active materials in org. electrolyte secondary **batteries**)
IT 13463-67-7P, Titania, uses
(rutile-type, **anode** active materials contg.; titanium mixed oxides contg. rutile as **anode** active materials in org. electrolyte secondary **batteries**)
IT **12060-00-3P**, Lead titanium oxide (PbTiO3) **12340-09-9P**, Tin titanium oxide (SnTiO3) 210909-32-3P, Germanium titanium oxide (GeTiO3)
(titanium mixed oxides contg. rutile as **anode** active materials in org. electrolyte secondary **batteries**)

L47 ANSWER 20 OF 36 HCAPLUS COPYRIGHT 2003 ACS
1998:804120 Document No. 130:54847 Anode materials for secondary nonaqueous-electrolyte **batteries** and **batteries** using these materials. Shimamura, Harunari; Okamura, Kazuhiro; Nitta, Yoshiaki (Matsushita Electric Industrial Co., Ltd., Japan). Eur. Pat. Appl. EP 883199 A1 19981209, 25 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO. (English). CODEN: EPXXDW. APPLICATION: EP 1998-110110 19980603. PRIORITY: JP 1997-144873 19970603; JP 1998-123199 19980506.
AB The composite title materials comprise a core formed by a solid phase A, and a solid phase Q partly or entirely wrapping the core. The amt. of Li **intercalation** and deintercalation by the phase A resulting from the charge and discharge is higher than that by the phase Q, however, the discharge capacity decrease of the phase Q resulting from **battery** cycling is low. The solid phase A comprises 1 of the materials selected from Li, .gtoreq.1 of the elements which is able to alloy with Li, solid soln. including

.gtoreq.1 of the above elements being able to alloy with Li, or an intermetallic compd. including .gtoreq.1 of the above elements being able to alloy with Li. The solid phase Q has a different compn., but comprises the same kind of materials except Li by itself as those of the solid phase A. It is essential that the solid phase Q is a mixed conductor having electronic as well as Li ionic cond. When these materials are used in the anode, a secondary nonaq.-electrolyte **battery** can be realized featuring high reliability, high cycle characteristic, a high capacity, and excellent high-rate charge and discharge characteristics.

IT **42616-53-5 53550-31-5 81876-77-9**
**81876-81-5 110633-84-6 131082-81-0**
**217074-37-8 217074-53-8 217075-12-2**
**217075-26-8 217075-44-0 217075-47-3**
**217075-55-3 217075-57-5**
(in composite anodes for secondary nonaq.-electrolyte **batteries**)

RN 42616-53-5 HCAPLUS
CN Zirconium alloy, base, Zr 62,Si 38 (9CI) (CA INDEX NAME)

| Component | Component Percent | Component Registry Number |
|---|---|---|
| Zr | 62 | 7440-67-7 |
| Si | 38 | 7440-21-3 |

RN 53550-31-5 HCAPLUS
CN Titanium alloy, base, Ti 64,Al 36 (9CI) (CA INDEX NAME)

| Component | Component Percent | Component Registry Number |
|---|---|---|
| Ti | 64 | 7440-32-6 |
| Al | 36 | 7429-90-5 |

RN 81876-77-9 HCAPLUS
CN Cerium alloy, base, Ce 72,Al 28 (9CI) (CA INDEX NAME)

| Component | Component Percent | Component Registry Number |
|---|---|---|
| Ce | 72 | 7440-45-1 |
| Al | 28 | 7429-90-5 |

RN 81876-81-5 HCAPLUS
CN Gallium alloy, base, Ga 50,Pr 50 (9CI) (CA INDEX NAME)

| Component | Component Percent | Component Registry Number |
|---|---|---|
| Ga | 50 | 7440-55-3 |
| Pr | 50 | 7440-10-0 |

RN 110633-84-6 HCAPLUS
CN Aluminum alloy, base, Al 63,Ti 37 (9CI) (CA INDEX NAME)

| Component | Component Percent | Component Registry Number |
|---|---|---|
| Al | 63 | 7429-90-5 |
| Ti | 37 | 7440-32-6 |

RN 131082-81-0 HCAPLUS
CN Tin alloy, base, Sn 72,Zr 28 (9CI) (CA INDEX NAME)

| Component | Component Percent | Component Registry Number |
|---|---|---|
| Sn | 72 | 7440-31-5 |
| Zr | 28 | 7440-67-7 |

RN 217074-37-8 HCAPLUS
CN Thorium alloy, base, Th 90,Al 10 (9CI) (CA INDEX NAME)

| Component | Component Percent | Component Registry Number |
|---|---|---|
| Th | 90 | 7440-29-1 |
| Al | 10 | 7429-90-5 |

RN 217074-53-8 HCAPLUS
CN Bismuth alloy, base, Bi 60,Ce 40 (9CI) (CA INDEX NAME)

| Component | Component Percent | Component Registry Number |
|---|---|---|
| Bi | 60 | 7440-69-9 |
| Ce | 40 | 7440-45-1 |

RN 217075-12-2 HCAPLUS
CN Thorium alloy, base, Th 74,Al 26 (9CI) (CA INDEX NAME)

| Component | Component Percent | Component Registry Number |
|---|---|---|
| Th | 74 | 7440-29-1 |
| Al | 26 | 7429-90-5 |

RN 217075-26-8 HCAPLUS
CN Bismuth alloy, base, Bi 75,Ce 25 (9CI) (CA INDEX NAME)

| Component | Component Percent | Component Registry Number |
|---|---|---|

| | | |
|---|---|---|
| Bi | 75 | 7440-69-9 |
| Ce | 25 | 7440-45-1 |

RN 217075-44-0 HCAPLUS
CN Praseodymium alloy, base, Pr 67,Ga 33 (9CI) (CA INDEX NAME)

| Component | Component Percent | Component Registry Number |
|---|---|---|
| Pr | 67 | 7440-10-0 |
| Ga | 33 | 7440-55-3 |

RN 217075-47-3 HCAPLUS
CN Antimony alloy, base, Sb 64,La 36 (9CI) (CA INDEX NAME)

| Component | Component Percent | Component Registry Number |
|---|---|---|
| Sb | 64 | 7440-36-0 |
| La | 36 | 7439-91-0 |

RN 217075-55-3 HCAPLUS
CN Zirconium alloy, base, Zr 76,Si 24 (9CI) (CA INDEX NAME)

| Component | Component Percent | Component Registry Number |
|---|---|---|
| Zr | 76 | 7440-67-7 |
| Si | 24 | 7440-21-3 |

RN 217075-57-5 HCAPLUS
CN Zirconium alloy, base, Zr 54,Sn 46 (9CI) (CA INDEX NAME)

| Component | Component Percent | Component Registry Number |
|---|---|---|
| Zr | 54 | 7440-67-7 |
| Sn | 46 | 7440-31-5 |

IC ICM H01M004-40
ICS H01M004-36; H01M004-02
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST anode composite material nonaq electrolyte **battery**
IT **Battery** anodes
(composite materials for secondary nonaq.-electrolyte)
IT 7439-93-2, Lithium, uses
(in composite anodes for secondary nonaq.-electrolyte **batteries**)
IT 7439-98-7, Molybdenum, uses 7440-21-3, Silicon, uses 12057-22-6, LiZn 12338-02-2 12359-06-7 12372-42-8, InLi 12588-27-1 12606-83-6 12625-55-7 12635-26-6 12719-97-0 12779-78-1 37201-99-3 37254-87-8 37345-56-5 39328-55-7 **42616-53-5**

52359-88-3 **53550-31-5** 53680-56-1 54739-65-0
54966-99-3 55823-21-7 56095-13-7 57896-14-7 57952-74-6
58817-42-8 58817-44-0 60224-91-1 65467-06-3, Barium alloy, Ba 56,Al 44 66758-27-8 67661-05-6 67828-86-8 68714-90-9
72048-17-0 73730-53-7 73990-63-3 74662-93-4 77325-33-8
78966-19-5 79818-26-1 80507-64-8 81754-08-7 **81876-77-9**
**81876-81-5** 82906-17-0 85746-90-3 87646-31-9
90738-65-1 96958-82-6 100502-97-4 101406-54-6 110109-09-6
110414-25-0 **110633-84-6** 112787-78-7 113470-14-7
114016-83-0 117816-43-0 118035-89-5 119281-87-7 119469-25-9
122381-65-1 126034-61-5 127706-34-7 128491-68-9 128491-69-0
**131082-81-0** 137747-27-4 140154-87-6 142536-01-4
145604-95-1 147856-99-3 148844-98-8 155759-82-3 158140-18-2
172919-16-3 173790-72-2 198958-08-6 204000-16-8 217074-33-4
**217074-37-8** 217074-44-7 217074-48-1 217074-51-6
**217074-53-8** 217074-57-2 217074-65-2 217074-68-5
217074-71-0 217074-75-4 217075-09-7 **217075-12-2**
217075-19-9 217075-21-3 217075-23-5 **217075-26-8**
217075-28-0 217075-30-4 217075-34-8 217075-38-2 217075-39-3
217075-40-6 217075-41-7 217075-42-8 217075-43-9
**217075-44-0** 217075-45-1 217075-46-2 **217075-47-3**
217075-48-4 217075-49-5 217075-50-8 217075-51-9 217075-52-0
217075-53-1 217075-54-2 **217075-55-3** 217075-56-4
**217075-57-5** 217075-58-6 217075-59-7 217075-61-1
217075-62-2 217075-63-3 217075-64-4 217075-65-5
(in composite anodes for secondary nonaq.-electrolyte **batteries**)

IT 79933-53-2P 126500-61-6P 169217-08-7P 217075-66-6P
(in composite anodes for secondary nonaq.-electrolyte **batteries**)

L47 ANSWER 21 OF 36 HCAPLUS COPYRIGHT 2003 ACS

1998:474026 Document No. 129:151119 Secondary **nonaqueous** -electrolyte **battery**. Ito, Shuji; Murata, Toshihide; Bito, Yasuhiko; Toyoguchi, Yoshinori (Matsushita Electric Industrial Co., Ltd., Japan). Eur. Pat. Appl. EP 853347 A1 19980715, 51 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO. (English). CODEN: EPXXDW. APPLICATION: EP 1997-122297 19971217. PRIORITY: JP 1996-341012 19961220; JP 1997-54947 19970310; JP 1997-163285 19970604.

AB The **anode** active material of the title **battery** having a high capacity and excellent cycling characteristics comprises a salt of a metal or a semimetal and a compd. selected from the oxo acids, HSCN, NCCN, and HCNO, where each oxo acid comprises an element selected N, S, C, B, P, Se, Te, W, Mo, Ti, Cr, Zr, Nb, Ta, Mn, and V, the salts of the oxo acids of P and B being restricted to hydrogen phosphates and hydrogen borates.

IT **11093-84-8**, Indium titanium oxide (In2TiO5)
**12048-51-0**, Bismuth titanium oxide (Bi2Ti2O7)
**12048-52-1**, Bismuth zirconium oxide (Bi2Zr3O9)
**12060-00-3**, Lead titanate PbTiO3 **12060-01-4**, Lead

zirconium oxide (PbZrO3) **12337-20-1**, Lead titanium oxide (PbTi3O7) **12600-76-9**, Tin zirconium oxide (SnZrO3) **37205-75-7**, Antimony titanium oxide (Sb3Ti2O10) **37368-61-9**, Bismuth titanium oxide (Bi2TiO5) **52014-36-5**, Tin titanate SnTiO4 **70692-95-4**, Aluminum zirconium oxide (Al2Zr3O9) **148523-56-2**, Indium zirconium oxide (In0.8Zr1.2O3.6) **210909-29-8**, Aluminum titanium oxide (AlTiO5) **210909-30-1**, Titanium oxide silicate (TiO4(SiO4)) **210909-31-2**, Gallium titanium oxide (GaTiO5) **210909-36-7**, Antimony zirconium oxide (Sb2Zr3O9) **210909-37-8**, Gallium zirconium oxide (Ga2Zr3O9) (**anode** active material for **lithium**-ion **batteries**)

RN 11093-84-8 HCAPLUS
CN Indium titanium oxide (In2TiO5) (8CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 5 | 17778-80-2 |
| In | 2 | 7440-74-6 |
| Ti | 1 | 7440-32-6 |

RN 12048-51-0 HCAPLUS
CN Bismuth titanium oxide (Bi2Ti2O7) (8CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 7 | 17778-80-2 |
| Bi | 2 | 7440-69-9 |
| Ti | 2 | 7440-32-6 |

RN 12048-52-1 HCAPLUS
CN Bismuth zirconium oxide (Bi2Zr3O9) (8CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 9 | 17778-80-2 |
| Bi | 2 | 7440-69-9 |
| Zr | 3 | 7440-67-7 |

RN 12060-00-3 HCAPLUS
CN Lead titanium oxide (PbTiO3) (8CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 3 | 17778-80-2 |
| Ti | 1 | 7440-32-6 |
| Pb | 1 | 7439-92-1 |

RN 12060-01-4 HCAPLUS
CN Lead zirconium oxide (PbZrO3) (8CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 3 | 17778-80-2 |
| Zr | 1 | 7440-67-7 |
| Pb | 1 | 7439-92-1 |

RN 12337-20-1 HCAPLUS
CN Lead titanium oxide (PbTi3O7) (8CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 7 | 17778-80-2 |
| Ti | 3 | 7440-32-6 |
| Pb | 1 | 7439-92-1 |

RN 12600-76-9 HCAPLUS
CN Tin zirconium oxide (SnZrO3) (8CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 3 | 17778-80-2 |
| Zr | 1 | 7440-67-7 |
| Sn | 1 | 7440-31-5 |

RN 37205-75-7 HCAPLUS
CN Antimony titanium oxide (Sb3Ti2O10) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 10 | 17778-80-2 |
| Sb | 3 | 7440-36-0 |
| Ti | 2 | 7440-32-6 |

RN 37368-61-9 HCAPLUS
CN Bismuth titanium oxide (Bi2TiO5) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 5 | 17778-80-2 |
| Bi | 2 | 7440-69-9 |
| Ti | 1 | 7440-32-6 |

RN 52014-36-5 HCAPLUS

CN Tin titanium oxide (SnTiO4) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 4 | 17778-80-2 |
| Ti | 1 | 7440-32-6 |
| Sn | 1 | 7440-31-5 |

RN 70692-95-4 HCAPLUS
CN Aluminum zirconium oxide (Al2Zr3O9) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 9 | 17778-80-2 |
| Zr | 3 | 7440-67-7 |
| Al | 2 | 7429-90-5 |

RN 148523-56-2 HCAPLUS
CN Indium zirconium oxide (In0.8Zr1.2O3.6) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 3.6 | 17778-80-2 |
| In | 0.8 | 7440-74-6 |
| Zr | 1.2 | 7440-67-7 |

RN 210909-29-8 HCAPLUS
CN Aluminum titanium oxide (AlTiO5) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 5 | 17778-80-2 |
| Ti | 1 | 7440-32-6 |
| Al | 1 | 7429-90-5 |

RN 210909-30-1 HCAPLUS
CN Titanium oxide silicate (TiO4(SiO4)) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 4 | 17778-80-2 |
| O4Si | 1 | 17181-37-2 |
| Ti | 1 | 7440-32-6 |

RN 210909-31-2 HCAPLUS
CN Gallium titanium oxide (GaTiO5) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 5 | 17778-80-2 |
| Ga | 1 | 7440-55-3 |
| Ti | 1 | 7440-32-6 |

RN 210909-36-7 HCAPLUS
CN Antimony zirconium oxide (Sb2Zr3O9) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 9 | 17778-80-2 |
| Zr | 3 | 7440-67-7 |
| Sb | 2 | 7440-36-0 |

RN 210909-37-8 HCAPLUS
CN Gallium zirconium oxide (Ga2Zr3O9) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 9 | 17778-80-2 |
| Zr | 3 | 7440-67-7 |
| Ga | 2 | 7440-55-3 |

IC ICM H01M004-62
ICS H01M004-48; H01M004-58
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST **nonaq** electrolyte **battery anode** metal salt; semimetal salt **nonaq** electrolyte **battery anode**; oxo acid salt **battery anode**; thiocyanic acid salt **battery anode**; cyanogen salt **battery anode**; cyanic acid salt **battery anode**
IT Secondary **batteries**
(high-performance **lithium**-ion)
IT Phosphates, uses
Sulfates, uses
(hydrogen, metal and semimetal; **anode** active material for **lithium**-ion **batteries**)
IT Bicarbonates
Borates
Carbonates, uses
Chromates
Cyanates
Cyanides (inorganic), uses
Manganates
Molybdates
Nitrates, uses
Nitrites

Phosphates, uses
Selenates
Selenites
Sulfates, uses
Sulfites
Thiocyanates
Thiosulfates
Titanates
Zirconates
(metal and semimetal; **anode** active material for **lithium**-ion **batteries**)

IT Group VB element compounds
(niobates, metal and semimetal; **anode** active material for **lithium**-ion **batteries**)

IT **Battery anodes**
(of metal or semimetal salts of cyanic acid or cyanogen or oxo acids or thiocyanic acid)

IT Group VB element compounds
(tantalates, metal and semimetal; **anode** active material for **lithium**-ion **batteries**)

IT Group VIA element compounds
(tellurates, metal and semimetal; **anode** active material for **lithium**-ion **batteries**)

IT Group VB element compounds
(vanadates, metal and semimetal; **anode** active material for **lithium**-ion **batteries**)

IT 306-61-6, Magnesium thiocyanate 471-34-1, Calcium carbonate, uses 513-77-9, Barium carbonate 513-78-0, Cadmium carbonate 513-79-1, Cobalt carbonate CoCO3 538-17-0, Aluminum thiocyanate 542-62-1, Barium cyanide 542-83-6, Cadmium cyanide 542-84-7, Cobalt cyanide (Co(CN)2) 546-93-0, Magnesium carbonate 557-19-7, Nickel cyanide (Ni(CN)2) 557-21-1, Zinc cyanide 557-42-6, Zinc thiocyanate 563-71-3, Ferrous carbonate 592-01-8, Calcium cyanide 592-05-2, Lead cyanide Pb(CN)2 592-87-0, Lead thiocyanate 598-62-9, Manganese carbonate 598-63-0, Lead carbonate 865-38-3, Cadmium thiocyanate 1184-64-1, Cupric carbonate 1633-05-2, Strontium carbonate 1948-47-6, Iron cyanide (Fe(CN)2) 2090-64-4, Magnesium bicarbonate 2092-16-2, Calcium thiocyanate 2092-17-3, Barium thiocyanate 2768-97-0, Indium thiocyanate 3017-60-5 3227-61-0 3227-62-1 3251-23-8, Cupric nitrate 3333-67-3, Nickel carbonate 3486-35-9, Zinc carbonate 3602-20-8, Tin thiocyanate 3999-98-2 4100-56-5, Magnesium cyanide 4367-08-2, Copper cyanide (Cu(CN)2) 4756-59-6 4756-65-4, Aluminum isocyanate 5702-63-6, Stibinetricarbonitrile 6010-09-9 6449-00-9, Chromium carbonate Cr2(CO3)3 6860-10-2, Calcium dicyanate 7446-10-8, Lead sulfite PbSO3 7446-14-2, Lead sulfate 7446-15-3 7487-88-9, Magnesium sulfate, uses 7488-51-9 7488-55-3 7720-78-7, Ferrous sulfate 7727-43-7, Barium sulfate 7733-02-0, Zinc sulfate 7757-86-0 7757-88-2, Magnesium sulfite 7757-95-1, Nickel sulfite NiSO3 7758-97-6, Lead chromate PbCrO4 7758-98-7, Copper sulfate, uses 7759-00-4 7759-01-5, Lead tungsten oxide (PbWO4) 7759-02-6, Strontium sulfate 7778-18-9,

Calcium sulfate 7779-86-4 7779-88-6, Zinc nitrate 7784-22-7 7785-87-7, Manganese sulfate 7786-81-4, Nickel sulfate 7787-39-5, Barium sulfite 7787-41-9 7787-68-0, Bismuth sulfate 7789-14-2 7789-82-4, Calcium molybdate CaMoO4 7790-75-2, Calcium tungsten oxide (CaWO4) 7790-83-2 7790-85-4, Cadmium tungsten oxide (CdWO4) 10022-31-8, Barium nitrate 10026-23-0 10028-26-9 10031-38-6 10042-76-9, Strontium nitrate 10043-01-3, Aluminum sulfate Al2(SO4)3 10048-98-3 10099-74-8 10099-79-3, Lead vanadium oxide (PbV2O6) 10101-52-7, Zirconium silicate (Zr0.5(SiO4)0.5) 10101-53-8, Chromium sulfate 10101-96-9 10102-02-0, Zinc nitrite 10124-36-4, Cadmium sulfate 10124-37-5, Calcium nitrate 10124-43-3, Cobalt sulfate 10124-53-5 10141-05-6 10174-28-4, Chromium tin oxide (CrSnO4) 10190-55-3, Lead molybdenum oxide (PbMoO4) 10214-40-1 10257-55-3, Calcium sulfite 10294-58-3 10325-94-7 10343-61-0, Titanium sulfate Ti2(SO4)3 10361-44-1 10377-57-8 10377-60-3, Magnesium nitrate 10377-66-9 **11093-84-8**, Indium titanium oxide (In2TiO5) 11120-61-9, Chromium tin oxide (CrSn2O6) 12013-45-5, Calcium niobium oxide (CaNb2O6) 12013-47-7, Calcium zirconium oxide (CaZrO3) 12013-95-5, Cadmium chromium oxide (CdCr2O4) 12014-14-1 , Cadmium titanium oxide (CdTiO3) 12025-16-0, Germanium manganese oxide (GeMnO3) 12032-31-4, Magnesium zirconium oxide (MgZrO3) 12034-88-7, Lead niobium oxide (PbNb2O6) 12034-89-8, Niobium strontium oxide (Nb2SrO6) 12036-39-4, Strontium zirconium oxide (SrZrO3) 12036-43-0, Titanium zinc oxide (TiZnO3) **12048-51-0**, Bismuth titanium oxide (Bi2Ti2O7) **12048-52-1**, Bismuth zirconium oxide (Bi2Zr3O9) 12050-35-0, Cadmium tantalum oxide (Cd2Ta2O7) 12056-04-1, Indium tantalum oxide (InTaO4) 12058-23-0, Molybdenum tin oxide (Mo2SnO8) 12059-64-2, Lead niobium oxide (Pb2Nb2O7) **12060-00-3**, Lead titanate PbTiO3 **12060-01-4**, Lead zirconium oxide (PbZrO3) 12064-15-2, Gallium manganese oxide (Ga2MnO4) 12065-82-6, Lead tantalum oxide (Pb2Ta2O7) 12138-50-0, Calcium tungsten oxide (CaWO3) 12139-18-3, Cadmium manganese oxide (CdMnO3) 12139-23-0, Cadmium zirconium oxide (CdZrO3) 12143-37-2, Strontium tungsten oxide (SrWO3) 12143-52-1, Lead oxide selenate (Pb2O(SeO4)) 12160-57-5, Gallium niobium oxide (GaNbO4) 12163-26-7, Magnesium niobium oxide (MgNb2O6) 12163-45-0, Manganese strontium oxide (MnSrO3) 12169-18-5, Zinc zirconium oxide (ZnZrO3) 12169-20-9, Antimony tantalum oxide (SbTaO4) 12177-86-5, Calcium manganese oxide (CaMnO3) 12187-14-3, Cadmium niobium oxide (Cd2Nb2O7) 12201-66-0, Niobium zinc oxide (Nb2ZnO6) 12209-35-7, Manganese tin oxide (MnSnO3) 12209-43-7, Manganese tin oxide (Mn2SnO4) 12232-83-6, Bismuth chromium oxide (BiCrO3) 12251-86-4, Aluminum tantalum oxide (AlTaO4) 12258-25-2, Aluminum niobium oxide (AlNbO4) 12272-28-5, Bismuth niobium oxide (BiNbO4) 12272-29-6, Bismuth tantalum oxide (BiTaO4) 12274-06-5, Manganese zinc oxide (MnZnO3) 12292-47-6, Chromium indium oxide (CrInO3) 12311-81-8, Antimony vanadium oxide (SbVO4) **12337-20-1**, Lead titanium oxide (PbTi3O7) 12340-07-7, Lead tungsten oxide (PbWO3) 12362-92-4, Niobium tin oxide (Nb2SnO6) 12362-93-5, Niobium tin oxide (Nb2Sn2O7) 12363-22-3, Tantalum tin oxide (Ta2Sn2O7)

12378-52-8, Gallium tantalum oxide (GaTaO4) 12379-00-9, Indium niobium oxide (InNbO4) 12421-98-6, Calcium tantalum oxide (Ca2Ta2O7) 12438-49-2, Magnesium tantalum oxide (Mg2Ta2O7) 12438-60-7, Lead manganese oxide (PbMnO3) 12440-09-4, Strontium tantalum oxide (Sr2Ta2O7) 12501-29-0, Tellurium tin oxide (Te3SnO8) 12588-16-8, Aluminum chromium oxide (AlCrO3) **12600-76-9**, Tin zirconium oxide (SnZrO3) 13074-68-5, Indium cyanide In(CN)3 13092-66-5 13138-45-9, Nickel nitrate 13450-99-2 13451-01-9 13451-02-0, Strontium sulfite 13451-05-3, Strontium tungsten oxide (SrWO4) 13453-58-2 13453-65-1 13464-82-9 13466-24-5 13468-91-2, Lead carbonate (PB(HCO3)2) 13470-04-7, Strontium molybdate SrMoO4 13473-90-0, Aluminum nitrate 13477-23-1, Cadmium sulfite CdSO3 13478-08-5 13478-50-7 13494-90-1, Gallium nitrate 13494-91-2, Gallium sulfate Ga2(SO4)3 13530-50-2 13530-54-6 13530-56-8, Aluminum vanadium oxide (AlVO4) 13530-65-9, Zinc chromate 13566-06-8, Vanadium sulfate VSO4 13568-71-3, Manganese sulfite 13573-11-0, Magnesium tungsten oxide (MgWO4) 13573-13-2, Magnesium vanadium oxide (MgV2O6) 13587-24-1 13595-85-2, Bismuth molybdenum oxide (Bi2Mo3O12) 13595-86-3, Bismuth tungsten oxide (Bi2WO6) 13595-87-4, Bismuth tungsten oxide (Bi2W3O12) 13596-21-9 13597-44-9, Zinc sulfite 13597-46-1 13597-54-1 13597-56-3, Tungsten zinc oxide (WZnO4) 13597-58-5, Strontium vanadium oxide (SrV2O6) 13598-37-3 13654-05-2 13689-92-4 13709-68-7 13718-59-7 13767-03-8, Magnesium molybdate MgMoO4 13767-32-3, Zinc molybdate ZnMoO4 13770-61-1 13773-83-6 13774-25-9 13780-03-5 13780-18-2 13814-56-7 13814-58-9 13814-59-0 13814-62-5 13819-17-5 13826-65-8 13826-70-5, Tin nitrate Sn(NO3)4 13845-15-3 13845-35-7 13847-12-6 13860-02-1 13912-55-5 13972-68-4, Cadmium molybdenum oxide (CdMoO4) 13977-75-8 14013-02-6, Copper sulfite CuSO3 14013-86-6, Ferrous nitrate 14019-91-1 14047-62-2, Aluminum nitrite Al(NO2)3 14059-33-7, Bismuth vanadium oxide (BiVO4) 14067-62-0 14312-01-7 14332-25-3 14332-34-4 14332-39-9 14332-59-3 14332-60-6 14355-35-2 14373-77-4 14455-29-9 14553-36-7, Tin tungsten oxide (SnWO4)

(**anode** active material for **lithium**-ion **batteries**)

IT 14590-19-3 14590-34-2 14590-38-6 14684-12-9 14696-77-6 14986-91-5 15060-62-5 15060-64-7 15070-34-5, Magnesium nitrite 15123-69-0 15123-80-5, Aluminum molybdate Al2(MoO4)3 15123-82-7, Aluminum tungsten oxide (Al2W3O12) 15123-95-2 15191-99-8 15192-76-4 15320-45-3, Gallium vanadium oxide (GaVO4) 15457-98-4 15469-59-7, Vanadium zinc oxide (V2ZnO6) 15514-01-9, Indium molybdenum oxide (In2Mo3O12) 15571-83-2, Indium tungsten oxide (In2W3O12) 15593-61-0 15593-64-3 15593-67-6 15600-69-8 15600-84-7 15702-34-8 15702-36-0 15730-53-7 15845-52-0 15852-05-8 15852-08-1 15852-09-2 15852-10-5 15852-13-8 15852-14-9 15852-18-3 15852-19-4 15852-20-7 15852-21-8 15857-43-9 16056-72-7, Cadmium vanadium oxide (CdV2O6) 16180-04-4 16508-95-5, Bismuth carbonate 16714-74-2, Tin vanadium oxide (SnV2O6) 16726-63-9 16834-09-6 16890-98-5

16905-09-2, Antimony manganese oxide (Sb2MnO4) 17153-86-5
17695-54-4 17740-80-6 18141-06-5 18488-89-6 18496-31-6
18496-38-3 18515-86-1 18526-81-3 18659-67-1 18725-92-3
18807-10-8 18808-44-1 18864-85-2 18864-86-3 19028-20-7
19307-28-9, Tin sulfate Sn(SO4)2 19853-03-3 20003-91-2, Gallium
tungsten oxide (Ga2W3O12) 20021-44-7 20328-96-5, Antimony
nitrate 20403-34-3 20943-22-0 20960-64-9 20960-79-6
22400-99-3, Manganese cyanide Mn(CN)2 22620-90-2 22755-27-7
23276-62-2 23377-49-3 23484-38-0, Indium vanadium oxide (InVO4)
23665-02-3 24283-38-3, Tin tungsten oxide (SnW2O8) 24468-27-7
24468-29-9 24738-38-3 25105-31-1 25268-69-3 25327-03-1
25599-25-1 31754-55-9 31967-38-1 32702-66-2, Cobalt sulfite
34045-16-4, Chromium oxide silicate (Cr2O4(SiO4)) 35387-42-9
35600-19-2, Antimony niobium oxide (SbNbO4) 35667-77-7, Tin
cyanide Sn(CN)2 **37205-75-7**, Antimony titanium oxide
(Sb3Ti2O10) 37322-77-3, Indium manganese oxide (In2MnO4)
**37368-61-9**, Bismuth titanium oxide (Bi2TiO5) 38150-63-9
38150-64-0 39422-66-7, Magnesium manganese oxide (MgMnO3)
39491-81-1 39712-38-4 40549-31-3, Aluminum sulfite Al2(SO3)3
42133-30-2 43384-63-0, Bismuth thiocyanate 43384-99-2, Gallium
thiocyanate 43636-19-7 44120-46-9 44121-71-3 44122-15-8
45189-55-7 50787-80-9 50787-82-1 50787-84-3 50820-24-1,
Ferrous sulfite 51306-12-8 51370-43-5, Silanetetracarbonitrile
51379-94-3 52014-18-3, Antimony manganese oxide (Sb2MnO6)
**52014-36-5**, Tin titanate SnTiO4 52236-42-7 52435-34-4
52435-47-9 52478-60-1 53237-26-6, Antimony molybdenum oxide
(Sb2Mo3O12) 53411-67-9 53851-21-1, Aluminum tungsten oxide
(AlWO4) 54250-24-7, Tantalum zinc oxide (Ta2Zn2O7) 54590-02-2,
Barium dicyanate 54828-73-8, Gallium molybdenum oxide (Ga2Mo3O12)
55135-61-0 55145-88-5 55306-22-4, Chromium cyanide (Cr(CN)3)
55927-25-8 56451-24-2, Indium vanadium oxide (In2VO5)
56627-48-6, Tin tungsten oxide (Sn2W3O8) 57538-97-3, Molybdenum
cyanide (Mo(CN)3) 59178-46-0 60459-04-3, Indium carbonate
60459-05-4 60492-87-7, Strontium titanium oxide (SrTiO4)
60763-29-3 60994-15-2 60994-16-3 61179-70-2, Bismuth manganese
oxide (Bi2MnO4) 61737-93-7 62196-27-4 64789-76-0 64896-84-0,
Germanium thiocyanate 66903-62-6 66903-65-9 66904-06-1
66906-87-4 67615-66-1 67615-67-2 67627-35-4 **70692-95-4**
, Aluminum zirconium oxide (Al2Zr3O9) 71070-32-1 71449-76-8
71456-91-2, Titanium cyanide Ti(CN)3 71520-17-7 71567-97-0
71843-93-1 71896-27-0, Bismuth sulfite 72296-38-9, Molybdenum
tin oxide (MoSnO4) 74421-56-0 77835-83-7 85450-13-1
86494-88-4 86893-88-1 87993-97-3, Aluminum cyanide Al(CN)3
88878-19-7 89161-76-2 91648-98-5 91785-92-1 91864-03-8
93805-27-7 94238-22-9 95925-37-4 97187-09-2 97631-71-5
97994-52-0, Germanium cyanide 99996-23-3 99996-26-6
100434-82-0 100436-77-9 100737-00-6 100737-27-7 100737-52-8
101059-22-7 105564-68-9 107630-45-5 107630-54-6 108064-26-2
111233-81-9 115010-02-1 115444-60-5 118131-59-2 118150-53-1
118832-97-6 118833-31-1 121526-85-0, Bismuthinetricarbonitrile
121814-63-9 121835-89-0, Vanadium oxide silicate (VO1.5(SiO4)0.5)
127324-46-3 128783-39-1 130263-24-0 130263-26-2 141982-08-3

**148523-56-2**, Indium zirconium oxide (In0.8Zr1.2O3.6)
149690-55-1 153584-46-4, Bismuth vanadium oxide (Bi2VO5)
154662-00-7, Calcium vanadium oxide (Ca0.5VO3) 157170-26-8
162257-57-0, Indium molybdenum oxide (InMo4O6) 163119-07-1
173979-77-6, Magnesium tungsten oxide (MgWO3) 182288-58-0
190017-27-7, Gallium cyanide Ga(CN)3 201029-73-4 202004-37-3
202004-38-4 202004-39-5 206182-17-4 210893-05-3 210893-06-4
210893-07-5 210893-08-6 210893-09-7 210893-10-0 210893-11-1,
Manganese tin nitrate (Mn0.22Sn0.78(NO3)2) 210893-12-2
210893-13-3, Iron tin nitrate (Fe0.12Sn0.88(NO3)2) 210893-14-4,
Cobalt tin nitrate (Co0.18Sn0.82(NO3)2) 210893-15-5, Copper tin
nitrate (Cu0.18Sn0.82(NO3)2) 210893-16-6, Tin titanium nitrate
(Sn0.82Ti0.12(NO3)2) 210893-17-7, Chromium tin nitrate
(Cr0.12Sn0.82(NO3)2) 210893-18-8, Tin zinc nitrate
(Sn0.88Zn0.12(NO3)2) 210893-19-9, Tin vanadium nitrate
(Sn0.82V0.12(NO3)2) 210893-22-4, Lead manganese nitrate
(Pb0.78Mn0.22(NO3)2)
(**anode** active material for **lithium**-ion **batteries**)

IT 210893-23-5, Iron lead nitrate (Fe0.12Pb0.88(NO3)2) 210893-24-6,
Cobalt lead nitrate (Co0.18Pb0.82(NO3)2) 210893-25-7, Copper lead
nitrate (Cu0.18Pb0.82(NO3)2) 210893-26-8, Lead titanium nitrate
(Pb0.82Ti0.12(NO3)2) 210893-27-9, Lead zinc nitrate
(Pb0.88Zn0.12(NO3)2) 210893-28-0, Chromium lead nitrate
(Cr0.12Pb0.82(NO3)2) 210893-29-1, Lead tungsten nitrate
(Pb0.82W0.09(NO3)2) 210893-30-4, Indium iron nitrate
(In0.88Fe0.18(NO3)3) 210893-31-5, Cobalt indium nitrate
(Co0.27In0.82(NO3)3) 210893-32-6, Copper indium nitrate
(Cu0.27In0.82(NO3)3) 210893-33-7, Bismuth titanium nitrate
(Bi0.82Ti0.27(NO3)3) 210893-34-8, Bismuth zinc nitrate
(Bi0.88Zn0.27(NO3)3) 210893-36-0 210893-37-1 210893-38-2
210893-41-7 210893-44-0 210893-45-1 210893-46-2 210893-47-3
210893-48-4 210893-50-8 210893-51-9 210893-52-0 210893-54-2
210893-55-3 210893-56-4 210893-57-5 210893-58-6 210893-59-7
210893-60-0 210893-61-1 210893-62-2 210893-63-3 210893-64-4,
Chromium tin carbonate (Cr0.2Sn0.7(CO3)) 210893-65-5, Tin titanium
carbonate (Sn0.7Ti0.2(CO3)) 210893-66-6 210893-67-7
210893-68-8 210893-69-9 210893-70-2 210893-71-3 210893-72-4
210893-73-5 210893-74-6 210893-75-7, Lead titanium carbonate
(Pb0.7Ti0.2(CO3)) 210893-76-8 210893-77-9, Chromium lead
carbonate (Cr0.2Pb0.7(CO3)) 210893-78-0 210893-79-1, Indium iron
carbonate (In1.6Fe0.6(CO3)3) 210893-80-4, Copper indium carbonate
(Cu0.6In1.6(CO3)3) 210893-81-5, Cobalt indium carbonate
(Co0.6In1.6(CO3)3) 210893-82-6, Bismuth titanium carbonate
(Bi1.6Ti0.4(CO3)3) 210893-83-7, Indium zinc carbonate
(In1.6Zn0.6(CO3)3) 210893-84-8, Barium tin carbonate
(Ba0.2Sn0.8(HCO3)2) 210893-85-9, Calcium tin carbonate
(Ca0.2Sn0.8(HCO3)2) 210893-86-0, Strontium tin carbonate
(Sr0.2Sn0.8(HCO3)2) 210893-87-1, Magnesium tin carbonate
(Mg0.2Sn0.8(HCO3)2) 210893-88-2, Manganese tin carbonate
(Mn0.2Sn0.8(HCO3)2) 210893-89-3, Iron tin carbonate
(Fe0.2Sn0.8(HCO3)2) 210893-90-6, Cobalt tin carbonate

(Co0.2Sn0.8(HCO3)2) 210893-91-7, Copper tin carbonate
(Cu0.2Sn0.8(HCO3)2) 210893-92-8, Tin titanium carbonate
(Sn0.7Ti0.2(HCO3)2) 210893-93-9, Tin zinc carbonate
(Sn0.8Zn0.2(HCO3)2) 210893-94-0, Chromium tin carbonate
(Cr0.2Sn0.7(HCO3)2) 210893-95-1, Molybdenum tin carbonate
(Mo0.2Sn0.8(HCO3)2) 210893-96-2, Barium lead carbonate
(Ba0.2Pb0.8(HCO3)2) 210893-97-3, Calcium lead carbonate
(Ca0.2Pb0.8(HCO3)2) 210893-98-4, Lead strontium carbonate
(Pb0.8Sr0.2(HCO3)2) 210893-99-5, Lead magnesium carbonate
(Pb0.8Mg0.2(HCO3)2) 210894-00-1, Lead manganese carbonate
(Pb0.8Mn0.2(HCO3)2) 210894-01-2, Iron lead carbonate
(Fe0.2Pb0.8(HCO3)2) 210894-02-3, Cobalt lead carbonate
(Co0.2Pb0.8(HCO3)2) 210894-03-4, Copper lead carbonate
(Cu0.2Pb0.8(HCO3)2) 210894-04-5, Lead titanium carbonate
(Pb0.7Ti0.2(HCO3)2) 210894-05-6, Lead zinc carbonate
(Pb0.8Zn0.2(HCO3)2) 210894-06-7, Chromium lead carbonate
(Cr0.2Pb0.7(HCO3)2) 210894-07-8, Lead molybdenum carbonate
(Pb0.8Mo0.2(HCO3)2) 210894-08-9, Indium iron carbonate
(In0.8Fe0.3(HCO3)3) 210894-09-0, Cobalt indium carbonate
(Co0.3In0.8(HCO3)3) 210894-10-3, Copper indium carbonate
(Cu0.3In0.8(HCO3)3) 210894-11-4, Bismuth titanium carbonate
(Bi0.8Ti0.2(HCO3)3) 210894-12-5, Bismuth zinc carbonate
(Bi0.8Zn0.3(HCO3)3) 210894-15-8 210894-16-9 210894-17-0
210894-18-1 210894-19-2 210894-20-5 210894-21-6 210894-22-7
210894-23-8 210894-24-9 210894-25-0 210894-26-1 210894-27-2
210894-29-4 210894-30-7 210894-31-8 210894-32-9 210894-33-0
210894-34-1 210894-36-3 210894-37-4, Barium tin borate
(Ba0.1Sn0.9(HBO3)) 210894-38-5, Calcium tin borate
(Ca0.1Sn0.9(HBO3)) 210894-39-6, Strontium tin borate
(Sr0.1Sn0.9(HBO3)) 210894-40-9, Magnesium tin borate
(Mg0.1Sn0.9(HBO3)) 210894-41-0, Tin zinc borate (Sn0.9Zn0.1(HBO3))
210894-42-1, Copper tin borate (Cu0.1Sn0.9(HBO3)) 210894-43-2,
Cobalt tin borate (Co0.1Sn0.9(HBO3)) 210894-44-3, Iron tin borate
(Fe0.1Sn0.9(HBO3)) 210894-45-4, Nickel tin borate
(Ni0.1Sn0.9(HBO3)) 210894-46-5, Tin titanium borate
(Sn0.7Ti0.2(HBO3)) 210894-47-6, Chromium tin borate
(Cr0.1Sn0.7(HBO3)) 210894-48-7, Tin vanadium borate
(Sn0.9V0.1(HBO3)) 210894-49-8, Molybdenum tin borate
(Mo0.1Sn0.9(HBO3)) 210894-50-1, Tin tungsten borate
(Sn0.8W0.1(HBO3)) 210894-51-2, Indium manganese borate
(In1.6Mn0.6(HBO3)3) 210894-52-3, Indium nickel borate
(In1.6Ni0.6(HBO3)3) 210894-53-4, Cobalt indium borate
(Co0.6In1.6(HBO3)3) 210894-54-5, Bismuth manganese borate
(Bi1.6Mn0.6(HBO3)3) 210894-55-6, Bismuth nickel borate
(Bi1.6Ni0.6(HBO3)3) 210894-56-7, Bismuth cobalt borate
(Bi1.6Co0.6(HBO3)3) 210894-57-8, Barium lead borate
(Ba0.1Pb0.9(HBO3)) 210894-58-9, Calcium lead borate
(Ca0.1Pb0.9(HBO3)) 210894-59-0, Lead strontium borate
(Pb0.9Sr0.1(HBO3)) 210894-60-3, Lead magnesium borate
(Pb0.9Mg0.1(HBO3)) 210894-62-5, Lead zinc borate
(Pb0.9Zn0.1(HBO3)) 210894-63-6, Copper lead borate
(Cu0.1Pb0.9(HBO3)) 210894-64-7, Cobalt lead borate

(Co0.1Pb0.9(HBO3)) 210894-65-8, Iron lead borate
(Fe0.1Pb0.9(HBO3)) 210894-66-9, Lead nickel borate
(Pb0.9Ni0.1(HBO3)) 210894-67-0, Lead titanium borate
(Pb0.7Ti0.2(HBO3)) 210894-68-1, Chromium lead borate
(Cr0.1Pb0.7(HBO3)) 210894-69-2, Lead vanadium borate
(Pb0.9V0.1(HBO3)) 210894-70-5, Lead molybdenum borate
(Pb0.9Mo0.1(HBO3)) 210894-71-6, Lead tungsten borate
(Pb0.8W0.1(HBO3)) 210894-72-7 210894-73-8 210894-74-9
210894-75-0 210894-76-1 210894-77-2 210894-78-3 210894-79-4
210894-80-7 210894-81-8 210894-82-9 210894-83-0 210894-84-1
210894-85-2 210894-92-1 210894-96-5 210895-00-4 210895-01-5
210895-02-6 210895-03-7 210895-04-8 210895-05-9 210895-06-0
210895-07-1 210895-08-2 210895-09-3 210895-11-7 210895-14-0
210895-15-1 210895-16-2 210895-17-3 210895-18-4 210895-19-5
210895-20-8 210895-21-9 210895-22-0 210895-23-1 210895-24-2
210895-25-3 210895-26-4 210895-27-5 210895-29-7 210895-32-2
210895-44-6 210895-45-7 210895-48-0 210895-58-2 210895-59-3
210895-60-6 210895-61-7 210895-62-8 210895-63-9 210895-64-0
210895-65-1 210895-66-2 210895-67-3 210895-68-4 210895-69-5
210895-70-8 210895-71-9 210895-72-0 210895-73-1 210895-74-2
210895-75-3 210895-76-4 210895-77-5 210895-78-6 210895-79-7
210895-80-0 210895-81-1 210895-82-2 210895-84-4 210895-85-5
210895-86-6 210895-87-7 210895-88-8 210895-89-9 210895-90-2
210895-91-3 210895-92-4 210895-93-5 210895-94-6 210895-95-7
210895-96-8 210895-97-9 210895-98-0 210895-99-1 210896-00-7
210896-01-8 210896-02-9 210896-03-0 210896-04-1 210896-05-2
210896-06-3 210896-07-4 210896-08-5 210896-09-6 210896-11-0
210896-13-2 210896-15-4 210896-17-6 210896-19-8 210896-21-2
210896-24-5
(**anode** active material for **lithium**-ion **batteries**)

IT 210896-29-0 210896-41-6 210896-44-9 210896-46-1 210896-48-3
210896-50-7 210896-52-9 210896-54-1 210896-56-3 210896-59-6
210896-61-0 210896-62-1 210896-63-2 210896-65-4 210896-67-6
210896-69-8 210896-74-5 210896-76-7 210896-78-9 210896-80-3
210896-82-5 210896-84-7 210896-86-9 210896-87-0 210896-88-1
210896-89-2 210896-90-5 210896-91-6 210896-92-7 210896-93-8
210896-94-9 210896-95-0 210896-96-1 210896-97-2 210896-98-3
210896-99-4 210897-00-0 210897-01-1 210897-03-3 210897-06-6
210897-08-8 210897-10-2 210897-12-4 210897-15-7 210897-17-9
210897-18-0 210897-19-1 210897-20-4 210897-21-5 210897-22-6
210897-23-7 210897-24-8 210897-26-0 210897-27-1 210897-29-3
210897-31-7 210897-34-0 210897-37-3 210897-39-5 210897-43-1
210897-47-5 210897-51-1 210897-55-5 210897-58-8 210897-61-3
210897-68-0 210897-79-3 210897-87-3 210897-90-8 210897-94-2
210897-99-7 210898-22-9 210898-39-8, Magnesium tin sulfate
(Mg0.1Sn0.9(SO4)) 210898-43-4, Strontium tin sulfate
(Sr0.1Sn0.9(SO4)) 210898-47-8, Calcium tin sulfate
(Ca0.1Sn0.9(SO4)) 210898-50-3, Tin zinc sulfate (Sn0.9Zn0.1(SO4))
210898-52-5, Nickel tin sulfate (Ni0.1Sn0.9(SO4)) 210898-53-6,
Iron tin sulfate (Fe0.1Sn0.9(SO4)) 210898-54-7, Cobalt tin sulfate
(Co0.1Sn0.9(SO4)) 210898-55-8, Manganese tin sulfate

(Mn0.1Sn0.9(SO4)) 210898-56-9, Copper tin sulfate
(Cu0.1Sn0.9(SO4)) 210898-57-0, Molybdenum tin sulfate
(Mo0.1Sn0.9(SO4)) 210898-58-1, Tin vanadium sulfate
(Sn0.9V0.1(SO4)) 210898-59-2, Tin tungsten sulfate
(Sn0.8W0.1(SO4)) 210898-60-5, Chromium tin sulfate
(Cr0.2Sn0.7(SO4)) 210898-62-7, Molybdenum tin sulfate
(Mo0.2Sn0.7(SO4)) 210898-64-9, Lead magnesium sulfate
(Pb0.9Mg0.1(SO4)) 210898-68-3, Lead strontium sulfate
(Pb0.9Sr0.1(SO4)) 210898-71-8, Calcium lead sulfate
(Ca0.1Pb0.9(SO4)) 210898-75-2, Lead zinc sulfate (Pb0.9Zn0.1(SO4))
210898-77-4, Lead nickel sulfate (Pb0.9Ni0.1(SO4)) 210898-79-6,
Iron lead sulfate (Fe0.1Pb0.9(SO4)) 210898-81-0, Cobalt lead
sulfate (Co0.1Pb0.9(SO4)) 210898-82-1, Lead manganese sulfate
(Pb0.9Mn0.1(SO4)) 210898-83-2, Copper lead sulfate
(Cu0.1Pb0.9(SO4)) 210898-84-3, Lead molybdenum sulfate
(Pb0.9Mo0.1(SO4)) 210898-85-4, Lead vanadium sulfate
(Pb0.9V0.1(SO4)) 210898-86-5, Lead tungsten sulfate
(Pb0.8W0.1(SO4)) 210898-87-6, Chromium lead sulfate
(Cr0.2Pb0.7(SO4)) 210898-88-7, Lead molybdenum sulfate
(Pb0.7Mo0.2(SO4)) 210898-89-8, Magnesium tin sulfate
(Mg0.1Sn0.9(HSO4)2) 210898-90-1, Strontium tin sulfate
(Sr0.1Sn0.9(HSO4)2) 210898-91-2, Calcium tin sulfate
(Ca0.1Sn0.9(HSO4)2) 210898-92-3, Tin zinc sulfate
(Sn0.9Zn0.1(HSO4)2) 210898-93-4, Nickel tin sulfate
(Ni0.1Sn0.9(HSO4)2) 210898-94-5, Iron tin sulfate
(Fe0.1Sn0.9(HSO4)2) 210898-95-6, Cobalt tin sulfate
(Co0.1Sn0.9(HSO4)2) 210898-96-7, Manganese tin sulfate
(Mn0.1Sn0.9(HSO4)2) 210898-97-8, Copper tin sulfate
(Cu0.1Sn0.9(HSO4)2) 210898-98-9, Molybdenum tin sulfate
(Mo0.1Sn0.9(HSO4)2) 210898-99-0, Tin vanadium sulfate
(Sn0.9V0.1(HSO4)2) 210899-00-6, Tin tungsten sulfate
(Sn0.8W0.1(HSO4)2) 210899-01-7, Chromium tin sulfate
(Cr0.2Sn0.7(HSO4)2) 210899-02-8, Molybdenum tin sulfate
(Mo0.2Sn0.7(HSO4)2) 210899-03-9, Lead magnesium sulfate
(Pb0.9Mg0.1(HSO4)2) 210899-04-0, Lead strontium sulfate
(Pb0.9Sr0.1(HSO4)2) 210899-05-1, Calcium lead sulfate
(Ca0.1Pb0.9(HSO4)2) 210899-06-2, Lead zinc sulfate
(Pb0.9Zn0.1(HSO4)2) 210899-07-3, Lead nickel sulfate
(Pb0.9Ni0.1(HSO4)2) 210899-09-5, Iron lead sulfate
(Fe0.1Pb0.9(HSO4)2) 210899-10-8, Cobalt lead sulfate
(Co0.1Pb0.9(HSO4)2) 210899-11-9, Lead manganese sulfate
(Pb0.9Mn0.1(HSO4)2) 210899-12-0, Copper lead sulfate
(Cu0.1Pb0.9(HSO4)2) 210899-13-1, Lead molybdenum sulfate
(Pb0.9Mo0.1(HSO4)2) 210899-14-2, Lead vanadium sulfate
(Pb0.9V0.1(HSO4)2) 210899-16-4, Lead tungsten sulfate
(Pb0.8W0.1(HSO4)2) 210899-18-6, Chromium lead sulfate
(Cr0.2Pb0.7(HSO4)2) 210899-20-0, Lead molybdenum sulfate
(Pb0.7Mo0.2(HSO4)2) 210899-22-2, Indium magnesium sulfate
(In1.6Mg0.6(SO4)3) 210899-23-3, Indium zinc sulfate
(In1.6Zn0.6(SO4)3) 210899-24-4, Indium nickel sulfate
(In1.6Ni0.6(SO4)3) 210899-25-5, Bismuth cobalt sulfate
(Bi1.6Co0.6(SO4)3) 210899-26-6, Bismuth iron sulfate

(Bi1.6Fe0.6(SO4)3) 210899-28-8, Bismuth manganese sulfate (Bi1.6Mn0.6(SO4)3) 210899-29-9 210899-30-2 210899-31-3 210899-32-4 210899-33-5, Cobalt indium sulfate (Co0.3In0.8(HSO4)3) 210899-34-6, Indium iron sulfate (In0.8Fe0.3(HSO4)3) 210899-35-7, Indium manganese sulfate (In0.8Mn0.3(HSO4)3) 210899-36-8, Bismuth magnesium sulfate (Bi0.8Mg0.3(HSO4)3) 210899-37-9, Bismuth zinc sulfate (Bi0.8Zn0.3(HSO4)3) 210899-38-0, Bismuth nickel sulfate (Bi0.8Ni0.3(HSO4)3) 210899-41-5, Tin sulfate (Sn(HSO4)0.2(SO4)0.9) 210899-43-7, Lead sulfate (Pb(HSO4)0.2(SO4)0.9) 210899-45-9, Indium sulfate (In2(HSO4)0.2(SO4)2.9) 210899-47-1, Bismuth sulfate (Bi2(HSO4)0.2(SO4)2.9) 210899-52-8 210899-53-9 210899-56-2 210899-74-4 210899-75-5 210899-76-6 210899-77-7 210899-81-3 210899-87-9 210899-95-9 210899-97-1 210900-00-8 210900-02-0 210900-03-1 210900-05-3 210900-07-5 210900-08-6 210900-09-7 210900-10-0 210900-11-1 210900-12-2 210900-14-4 210900-24-6 210900-29-1 210900-40-6 210900-49-5 210900-55-3 210900-61-1 210900-68-8 210900-77-9 210900-94-0 210901-01-2 210901-08-9 210901-16-9 210901-21-6 210901-28-3 210901-33-0 210901-36-3 210901-39-6 210901-49-8 210901-59-0 210901-64-7 210901-68-1, Magnesium tin selenate (Mg0.1Sn0.9(SeO4)) 210901-72-7, Tin zinc selenate (Sn0.9Zn0.1(SeO4)) 210901-75-0, Nickel tin selenate (Ni0.1Sn0.9(SeO4)) 210901-78-3, Iron tin selenate (Fe0.1Sn0.9(SeO4)) 210901-82-9, Cobalt tin selenate (Co0.1Sn0.9(SeO4)) 210901-85-2, Manganese tin selenate (Mn0.1Sn0.9(SeO4)) 210901-88-5, Copper tin selenate (Cu0.1Sn0.9(SeO4)) 210901-90-9, Molybdenum tin selenate (Mo0.1Sn0.9(SeO4)) 210901-92-1, Tin vanadium selenate (Sn0.9V0.1(SeO4)) 210901-94-3, Tin tungsten selenate (Sn0.8W0.1(SeO4)) 210901-98-7, Chromium tin selenate (Cr0.2Sn0.7(SeO4)) 210902-03-7, Calcium tin selenate (Ca0.1Sn0.9(SeO4)) 210902-05-9, Strontium tin selenate (Sr0.1Sn0.9(SeO4)) 210902-06-0, Barium tin selenate (Ba0.1Sn0.9(SeO4)) 210902-07-1, Lead magnesium selenate (Pb0.9Mg0.1(SeO4)) 210902-08-2, Lead zinc selenate (Pb0.9Zn0.1(SeO4)) 210902-09-3, Lead nickel selenate (Pb0.9Ni0.1(SeO4)) 210902-10-6, Iron lead selenate (Fe0.1Pb0.9(SeO4)) 210902-11-7, Cobalt lead selenate (Co0.1Pb0.9(SeO4)) 210902-12-8, Lead manganese selenate (Pb0.9Mn0.1(SeO4)) 210902-13-9, Copper lead selenate (Cu0.1Pb0.9(SeO4)) 210902-14-0, Lead molybdenum selenate (Pb0.9Mo0.1(SeO4)) 210902-15-1, Lead vanadium selenate (Pb0.9V0.1(SeO4)) 210902-16-2, Calcium lead selenate (Ca0.1Pb0.9(SeO4)) 210902-17-3, Lead strontium selenate (Pb0.9Sr0.1(SeO4)) 210902-18-4, Barium lead selenate (Ba0.1Pb0.9(SeO4)) 210902-19-5, Lead tungsten selenate (Pb0.8W0.1(SeO4)) 210902-20-8, Chromium lead selenate (Cr0.2Pb0.7(SeO4)) 210902-21-9, Magnesium tin selenate (Mg0.1Sn0.9(HSeO4)) 210902-22-0, Tin zinc selenate (Sn0.9Zn0.1(HSeO4)) 210902-23-1, Nickel tin selenate (Ni0.1Sn0.9(HSeO4)) 210902-24-2, Iron tin selenate (Fe0.1Sn0.9(HSeO4)) 210902-25-3, Cobalt tin selenate (Co0.1Sn0.9(HSeO4)) 210902-26-4, Manganese tin selenate

(Mn0.1Sn0.9(HSeO4)) 210902-27-5, Copper tin selenate
(Cu0.1Sn0.9(HSeO4)) 210902-28-6, Molybdenum tin selenate
(Mo0.1Sn0.9(HSeO4)) 210902-29-7, Tin vanadium selenate
(Sn0.9V0.1(HSeO4)) 210902-30-0, Calcium tin selenate
(Ca0.1Sn0.9(HSeO4)) 210902-31-1, Strontium tin selenate
(Sr0.1Sn0.9(HSeO4)) 210902-32-2, Barium tin selenate
(Ba0.1Sn0.9(HSeO4)) 210902-33-3, Tin tungsten selenate
(Sn0.8W0.1(HSeO4)) 210902-34-4, Chromium tin selenate
(Cr0.2Sn0.7(HSeO4)) 210902-35-5, Lead magnesium selenate
(Pb0.9Mg0.1(HSeO4)) 210902-36-6, Lead zinc selenate
(Pb0.9Zn0.1(HSeO4)) 210902-37-7, Lead nickel selenate
(Pb0.9Ni0.1(HSeO4)) 210902-38-8, Iron lead selenate
(Fe0.1Pb0.9(HSeO4)) 210902-39-9, Cobalt lead selenate
(Co0.1Pb0.9(HSeO4)) 210902-40-2, Lead manganese selenate
(Pb0.9Mn0.1(HSeO4)) 210902-41-3, Copper lead selenate
(Cu0.1Pb0.9(HSeO4)) 210902-43-5, Lead molybdenum selenate
(Pb0.9Mo0.1(HSeO4)) 210902-45-7, Lead vanadium selenate
(Pb0.9V0.1(HSeO4))
(**anode** active material for **lithium**-ion **batteries**)

IT 210902-47-9, Calcium lead selenate (Ca0.1Pb0.9(HSeO4))
210902-49-1, Lead strontium selenate (Pb0.9Sr0.1(HSeO4))
210902-50-4, Barium lead selenate (Ba0.1Pb0.9(HSeO4)) 210902-51-5, Lead tungsten selenate (Pb0.8W0.1(HSeO4)) 210902-52-6, Chromium lead selenate (Cr0.2Pb0.7(HSeO4)) 210902-53-7, Indium magnesium selenate (In1.6Mg0.6(SeO4)3) 210902-54-8, Indium zinc selenate
(In1.6Zn0.6(SeO4)3) 210902-55-9, Indium nickel selenate
(In1.6Ni0.6(SeO4)3) 210902-56-0, Bismuth cobalt selenate
(Bi1.6Co0.6(SeO4)3) 210902-57-1, Bismuth iron selenate
(Bi1.6Fe0.6(SeO4)3) 210902-58-2, Bismuth manganese selenate
(Bi1.6Mn0.6(SeO4)3) 210902-59-3, Cobalt indium selenate
(Co0.3In0.8(HSeO4)3) 210902-60-6, Indium iron selenate
(In0.8Fe0.3(HSeO4)3) 210902-61-7, Indium manganese selenate
(In0.8Mn0.3(HSeO4)3) 210902-62-8, Bismuth magnesium selenate
(Bi0.8Mg0.3(HSeO4)3) 210902-63-9, Bismuth zinc selenate
(Bi0.8Zn0.3(HSeO4)3) 210902-64-0, Bismuth nickel selenate
(Bi0.8Ni0.3(HSeO4)3) 210902-65-1 210902-66-2 210902-68-4, Lead tellurium oxide (PbTe3O8) 210902-70-8 210902-72-0 210902-74-2
210902-75-3 210902-77-5 210902-78-6 210902-85-5 210902-86-6
210902-87-7 210902-88-8 210902-92-4 210902-95-7 210902-97-9
210902-98-0 210902-99-1 210903-00-7 210903-01-8 210903-02-9
210903-03-0 210903-04-1 210903-05-2 210903-06-3 210903-07-4
210903-08-5 210903-09-6 210903-10-9 210903-11-0 210903-13-2
210903-15-4 210903-18-7 210903-26-7, Magnesium tin tellurate
(Mg0.1Sn0.9(TeO4)) 210903-28-9, Calcium tin tellurate
(Ca0.1Sn0.9(TeO4)) 210903-32-5, Strontium tin tellurate
(Sr0.1Sn0.9(TeO4)) 210903-36-9, Tin zinc tellurate
(Sn0.9Zn0.1(TeO4)) 210903-38-1, Nickel tin tellurate
(Ni0.1Sn0.9(TeO4)) 210903-41-6, Iron tin tellurate
(Fe0.1Sn0.9(TeO4)) 210903-44-9, Cobalt tin tellurate
(Co0.1Sn0.9(TeO4)) 210903-47-2, Manganese tin tellurate
(Mn0.1Sn0.9(TeO4)) 210903-50-7, Copper tin tellurate

(Cu0.1Sn0.9(TeO4)) 210903-53-0, Molybdenum tin tellurate
(Mo0.1Sn0.9(TeO4)) 210903-56-3, Tin vanadium tellurate
(Sn0.9V0.1(TeO4)) 210903-59-6, Tin tungsten tellurate
(Sn0.8W0.1(TeO4)) 210903-62-1, Chromium tin tellurate
(Cr0.2Sn0.7(TeO4)) 210903-65-4, Lead magnesium tellurate
(Pb0.9Mg0.1(TeO4)) 210903-68-7, Calcium lead tellurate
(Ca0.1Pb0.9(TeO4)) 210903-72-3, Lead strontium tellurate
(Pb0.9Sr0.1(TeO4)) 210903-76-7, Lead zinc tellurate
(Pb0.9Zn0.1(TeO4)) 210903-80-3, Lead nickel tellurate
(Pb0.9Ni0.1(TeO4)) 210903-83-6, Iron lead tellurate
(Fe0.1Pb0.9(TeO4)) 210903-86-9, Cobalt lead tellurate
(Co0.1Pb0.9(TeO4)) 210903-89-2, Lead manganese tellurate
(Pb0.9Mn0.1(TeO4)) 210903-93-8, Copper lead tellurate
(Cu0.1Pb0.9(TeO4)) 210903-97-2, Lead molybdenum tellurate
(Pb0.9Mo0.1(TeO4)) 210903-98-3, Lead vanadium tellurate
(Pb0.9V0.1(TeO4)) 210903-99-4, Lead tungsten tellurate
(Pb0.9W0.1(TeO4)) 210904-01-1 210904-02-2 210904-04-4
210904-06-6 210904-09-9 210904-12-4 210904-15-7 210904-19-1
210904-21-5 210904-23-7 210904-25-9 210904-27-1 210904-29-3
210904-31-7 210904-33-9 210904-35-1 210904-37-3 210904-39-5
210904-41-9 210904-43-1 210904-46-4 210904-50-0 210904-53-3
210904-56-6 210904-60-2 210904-62-4 210904-65-7 210904-69-1
210904-72-6 210904-76-0 210904-79-3, Chromium lead tellurate
(Cr0.2Pb0.7(TeO4)) 210904-81-7, Indium magnesium tellurate
(In1.6Mg0.6(TeO6)) 210904-83-9, Indium zinc tellurate
(In1.6Zn0.6(TeO6)) 210904-85-1, Indium iron tellurate
(In1.6Fe0.6(TeO6)) 210904-86-2, Bismuth magnesium tellurate
(Bi1.6Mg0.6(TeO6)) 210904-87-3, Bismuth zinc tellurate
(Bi1.6Zn0.6(TeO6)) 210904-88-4, Bismuth iron tellurate
(Bi1.6Fe0.6(TeO6)) 210904-89-5 210904-90-8 210904-92-0
210904-96-4 210905-01-4 210905-03-6 210905-05-8 210905-07-0
210905-28-5 210905-34-3 210905-51-4 210905-58-1 210905-78-5
210905-85-4 210906-06-2 210906-18-6 210906-47-1 210906-54-0
210906-60-8 210906-67-5 210906-73-3 210906-79-9 210906-86-8
210906-93-7 210907-00-9 210907-06-5, Tin titanium phosphate
(Sn0.7Ti0.2(HPO4)) 210907-11-2 210907-15-6, Chromium tin
phosphate (Cr0.2Sn0.7(HPO4)) 210907-19-0 210907-23-6, Tin
tungsten phosphate (Sn0.8W0.1(HPO4)) 210907-27-0 210907-31-6
210907-34-9 210907-38-3 210907-41-8 210907-43-0 210907-46-3
210907-50-9 210907-52-1 210907-54-3 210907-56-5, Lead titanium
phosphate (Pb0.7Ti0.2(HPO4)) 210907-58-7, Chromium lead phosphate
(Cr0.2Pb0.7(HPO4)) 210907-60-1, Lead tungsten phosphate
(Pb0.8W0.1(HPO4)) 210907-62-3, Tin (diphosphate) phosphate
(Sn2(P2O7)0.9(HPO4)0.2) 210907-64-5, Tin (diphosphate) phosphate
(Sn2(P2O7)0.8(HPO4)0.4) 210907-66-7, Lead (diphosphate) phosphate
(Pb2(P2O7)0.9(HPO4)0.2) 210907-68-9, Lead (diphosphate) phosphate
(Pb2(P2O7)0.8(HPO4)0.4) 210907-70-3, Stannanetetracarbonitrile
210907-74-7 210907-81-6 210907-86-1 210907-89-4 210907-92-9
210907-95-2, Vanadium cyanide (V(CN)2) 210907-98-5 210908-00-2
210908-03-5 210908-07-9 210908-09-1 210908-11-5 210908-13-7
210908-15-9 210908-17-1 210908-19-3, Niobium cyanide (Nb(CN)3)
210908-21-7 210908-24-0 210908-27-3, Tin zinc cyanide

(SnZn(CN)4) 210908-29-5 210908-34-2 210908-40-0 210908-43-3, Nickel tin cyanide (NiSn(CN)4) 210908-47-7 210908-51-3 210908-54-6, Tin titanium cyanide (SnTi(CN)5) 210908-58-0 210908-61-5, Lead nickel cyanide (PbNi(CN)4) 210908-64-8 210908-67-1 210908-71-7, Lead zinc cyanide (PbZn(CN)4) 210908-74-0 210908-76-2 210908-79-5 210908-83-1 210908-85-3, Lead titanium cyanide (PbTi(CN)5) 210908-87-5 210908-88-6, Copper indium cyanide (CuIn(CN)5) 210908-89-7 210908-90-0 210908-94-4, Indium magnesium cyanide (InMg(CN)5) 210908-96-6, Bismuth copper cyanide (BiCu(CN)5) 210908-98-8 210909-01-6 210909-03-8, Bismuth calcium cyanide (BiCa(CN)5) 210909-06-1, Bismuth magnesium cyanide (BiMg(CN)5) 210909-08-3, Tungsten oxide silicate (W2O4(SiO4)) 210909-10-7, Cadmium tungsten oxide (CdWO3) 210909-13-0, Indium tungsten oxide (InW3O9) 210909-15-2, Antimony tungsten oxide (Sb2W3O12) 210909-17-4, Tungsten zinc oxide (WZnO3) 210909-19-6, Gallium tungsten oxide (Ga2W3O9) 210909-20-9, Germanium tungsten oxide (GeW2O8) 210909-21-0, Germanium tungsten oxide (GeW2O6) 210909-27-6, Molybdenum oxide silicate (Mo2O4(SiO4)) 210909-28-7, Germanium molybdenum oxide (GeMoO4) **210909-29-8**, Aluminum titanium oxide (AlTiO5) **210909-30-1**, Titanium oxide silicate (TiO4(SiO4)) **210909-31-2**, Gallium titanium oxide (GaTiO5) 210909-32-3, Germanium titanium oxide (GeTiO3) 210909-33-4, Magnesium titanium oxide (MgTiO4) 210909-34-5, Calcium titanium oxide (CaTiO4) **210909-36-7**, Antimony zirconium oxide (Sb2Zr3O9) **210909-37-8**, Gallium zirconium oxide (Ga2Zr3O9) 210909-38-9, Germanium zirconium oxide (GeZrO3) 210909-40-3, Tin vanadium oxide (SnVO3) 210909-41-4, Lead vanadium oxide (PbVO3) 210909-45-8, Germanium vanadium oxide (GeV2O6) 210909-50-5, Chromium lead oxide (CrPb3O6) 210909-51-6, Bismuth chromium oxide (Bi2CrO6) 210909-53-8, Chromium indium oxide (CrIn2O6) 210909-54-9, Antimony chromium oxide (Sb2Cr3O12) 210909-56-1, Chromium gallium oxide (Cr2Ga3O8) 210909-58-3, Chromium germanium oxide (CrGeO4) 210909-59-4, Chromium magnesium oxide (Cr2MgO7) 210909-62-9, Calcium chromium oxide (CaCr2O7) 210909-65-2, Chromium strontium oxide (Cr2SrO7) 210909-75-4, Germanium niobium oxide (GeNb2O6) 210909-76-5, Tantalum oxide silicate (Ta2O(SiO3)2) 210909-77-6, Germanium tantalum oxide (Ge2Ta2O7) 210909-78-7, Aluminum manganese oxide (Al2MnO6)
(**anode** active material for **lithium**-ion **batteries**)

IT 210909-80-1, Bismuth manganese oxide (Bi2MnO6) 210909-81-2, Indium manganese oxide (In2MnO6)
(**anode** active material for **lithium**-ion **batteries**)

IT 130811-82-4P, Cobalt **lithium** manganese oxide (Co0.2LiMn1.8O4)
(**battery** cathodes)

IT 12737-86-9, Tungstate
(metal and semimetal; **anode** active material for **lithium**-ion **batteries**)

L47 ANSWER 22 OF 36 HCAPLUS COPYRIGHT 2003 ACS
1998:219955 Document No. 128:297098 Tin oxide-based fibers as **nonaqueous** electrolyte secondary **battery** **anode** active mass and same **batteries**. Tachibana, Shoji; Yamashita, Hiroya; Saito, Shinichi (Tokuyama Soda Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 10092426 A2 19980410 Heisei, 21 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1996-249486 19960920.

AB The title fibers have 1-50 .mu.m diam. and .gtoreq.10 aspect ratio. Preferably, the fibers are manufd. by sol-gel process involving concg. and spinning precursor-contg. alc. solns., and firing. **Li** secondary **batteries** using the Sn oxide-based fiber **anodes** are also claimed. The **anodes** show high capacity and the fibers are resistant to exfoliation from **anode** current collectors.

IT **123213-50-3P**, Tin zirconium oxide **139920-08-4P**, Tin titanium oxide
(fibers; prepn. of Sn oxide-based fibers as **nonaq.** electrolyte **Li** secondary **battery** **anodes**)

RN 123213-50-3 HCAPLUS
CN Tin zirconium oxide (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | x | 17778-80-2 |
| Zr | x | 7440-67-7 |
| Sn | x | 7440-31-5 |

RN 139920-08-4 HCAPLUS
CN Tin titanium oxide (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | x | 17778-80-2 |
| Ti | x | 7440-32-6 |
| Sn | x | 7440-31-5 |

IC ICM H01M004-48
ICS H01M004-02; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 57
ST **lithium battery anode** tin oxide fiber; sol gel process tin oxide fiber
IT Synthetic fibers
(Sn oxide; prepn. of Sn oxide-based fibers as **nonaq.** electrolyte **Li** secondary **battery** **anodes**)
IT Synthetic fibers
(ceramic, Sn oxide; prepn. of Sn oxide-based fibers as

**nonaq**. electrolyte **Li** secondary **battery** **anodes**)

IT Ceramics
(fibers, Sn oxide; prepn. of Sn oxide-based fibers as **nonaq**. electrolyte **Li** secondary **battery** **anodes**)

IT Polyoxyalkylenes, uses
(in prepn. of Sn oxide-based fibers as **nonaq**. electrolyte **Li** secondary **battery** **anodes**)

IT **Battery anodes**
Sol-gel processing
(prepn. of Sn oxide-based fibers as **nonaq**. electrolyte **Li** secondary **battery anodes**)

IT 18282-10-5P, Tin oxide (sno2)
(fibers; Sn oxide-based fibers as **nonaq**. electrolyte **Li** secondary **battery anodes**)

IT 12673-86-8P, Antimony tin oxide 37349-60-3P, Tantalum tin oxide 39409-74-0P, Niobium tin oxide 39467-03-3P, Magnesium tin oxide 58500-40-6P, Silicon tin oxide 63055-52-7P, Germanium tin oxide 72779-38-5P, Aluminum tin oxide **123213-50-3P**, Tin zirconium oxide 126998-48-9P, Boron tin oxide **139920-08-4P**, Tin titanium oxide 180795-32-8P, Antimony tin oxide silicide
(fibers; prepn. of Sn oxide-based fibers as **nonaq**. electrolyte **Li** secondary **battery** **anodes**)

IT 64-17-5, Ethanol, uses 67-56-1, Methanol, uses 110-80-5, 2-Ethoxyethanol 25322-68-3, Polyethylene oxide
(in prepn. of Sn oxide-based fibers as **nonaq**. electrolyte **Li** secondary **battery** **anodes**)

IT 78-10-4, Tetraethoxysilane 121-43-7, Trimethoxyboron 1071-76-7, Tetrabutoxyzirconium 5593-70-4, Tetrabutoxytitanium 7440-31-5, Tin, processes 7446-70-0, Aluminum chloride (alcl3), processes 7721-01-9, Tantalum pentachloride 7772-99-8, Tin chloride (sncl2), processes 7786-30-3, Magnesium chloride (mgcl2), processes 10025-91-9, Antimony chloride (sbcl3) 10026-12-7, Niobium pentachloride 10433-06-4, Triethoxyantimony 14165-55-0, Tetraethoxygermanium
(in prepn. of Sn oxide-based fibers as **nonaq**. electrolyte **Li** secondary **battery** **anodes**)

L47 ANSWER 23 OF 36 HCAPLUS COPYRIGHT 2003 ACS

1998:219954 Document No. 128:284643 Manufacture of tin dioxide-based anode active material for **nonaqueous** electrolyte secondary **battery**. Tachibana, Shoji; Yamashita, Hironari; Saito, Shinichi (Tokuyama Soda Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 10092425 A2 19980410 Heisei, 18 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1996-244947 19960917.

AB The anode active material is manufd. by dissolving a Sn compd. and/or Sn in an alc., concg. the precursor soln., and firing. The

precursor soln. may contain an alc.-sol. compd. of an element which improves elec. cond., mech. strength, or cycle life. The anode active material can be obtained in high yield with high reproducibility in a short time.

IT **123213-50-3P**, Tin zirconium oxide
(anode; sol-gel prepn. of tin dioxide-based anode active material for **nonaq**. electrolyte secondary **battery**)

RN 123213-50-3 HCAPLUS

CN Tin zirconium oxide (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | x | 17778-80-2 |
| Zr | x | 7440-67-7 |
| Sn | x | 7440-31-5 |

IC ICM H01M004-48
ICS H01M004-02; H01M004-04

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST **nonaq** electrolyte **battery** anode manuf; tin dioxide sol gel **battery** anode

IT **Battery** anodes
(sol-gel prepn. of tin dioxide anode active material for **nonaq**. electrolyte secondary **battery**)

IT Alcohols, uses
(sol-gel prepn. of tin dioxide anode active material for **nonaq**. electrolyte secondary **battery**)

IT 39467-03-3P, Magnesium tin oxide 58500-40-6P, Silicon tin oxide 63055-52-7P, Germanium tin oxide 72779-38-5P, Aluminum tin oxide **123213-50-3P**, Tin zirconium oxide 126998-48-9P, Boron tin oxide
(anode; sol-gel prepn. of tin dioxide-based anode active material for **nonaq**. electrolyte secondary **battery**)

IT 18282-10-5P, Tin dioxide
(sol-gel prepn. of tin dioxide anode active material for **nonaq**. electrolyte secondary **battery**)

IT 67-56-1, Methanol, uses 110-80-5, 2-Ethoxyethanol
(sol-gel prepn. of tin dioxide anode active material for **nonaq**. electrolyte secondary **battery**)

IT 7440-31-5, Tin, uses 7772-99-8, Tin chloride, uses 10031-24-0, Tin bromide (snbr2)
(sol-gel prepn. of tin dioxide anode active material for **nonaq**. electrolyte secondary **battery**)

L47 ANSWER 24 OF 36 HCAPLUS COPYRIGHT 2003 ACS

1997:446244 Document No. 127:153893 The structure design and operation optimization of lead anode in the process of nitrobenzene electrochemical reduction to p-aminophenol in sulfuric acid solution. Xu, Wenlin; Wang, Yaqiong; Wang, Baocheng (Research Centre of Chemical Technology, Taiyuan University of Technology, Taiyuan, 030024, Peop. Rep. China). Selected Papers of Engineering

Chemistry and Metallurgy (China), Volume Date 1996 68-73 (English) 1997. CODEN: SPEMFQ. Publisher: Science Press.

AB Lead is the most efficient and widely employed material as anode in sulfuric acid soln. The structure design and operation optimization for the lead anode is discussed in the process of nitrobenzene electrochem. redn. to p-aminophenol in sulfuric acid soln.

IT **67054-46-0**
(anode in cell with mesh copper net cathode in cell for nitrobenzene redn.)

RN 67054-46-0 HCAPLUS

CN Lead alloy, base, Pb,Ti (9CI) (CA INDEX NAME)

| Component | Component Registry Number |
|---|---|
| Pb | 7439-92-1 |
| Ti | 7440-32-6 |

IT **7782-44-7**, Oxygen, properties
(evolution kinetics on lead and lead alloy anodes in sulfuric acid soln.: structure design and operation optimization of lead anode in process of nitrobenzene electrochem. redn. to aminophenol in sulfuric acid soln.)

RN 7782-44-7 HCAPLUS

CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O═O

CC 72-2 (Electrochemistry)
Section cross-reference(s): 22, 25, 56, 67

IT **Oxidation** kinetics
(electrochem.; in oxygen evolution on lead and lead alloy anodes in sulfuric acid soln.: structure design and operation optimization of lead anode in process of nitrobenzene electrochem. redn. to aminophenol in sulfuric acid soln.)

IT **Electrolytic cells**
(for nitrobenzene redn.)

IT Exchange current (electric)
**Oxidation**, electrochemical
(in oxygen evolution on lead and lead alloy anodes in sulfuric acid soln.: structure design and operation optimization of lead anode in process of nitrobenzene electrochem. redn. to aminophenol in sulfuric acid soln.)

IT **67054-46-0**
(anode in cell with mesh copper net cathode in cell for nitrobenzene redn.)

IT **7782-44-7**, Oxygen, properties
(evolution kinetics on lead and lead alloy anodes in sulfuric acid soln.: structure design and operation optimization of lead anode in process of nitrobenzene electrochem. redn. to

aminophenol in sulfuric acid soln.)

L47 ANSWER 25 OF 36 HCAPLUS COPYRIGHT 2003 ACS
1997:151392 Document No. 126:174247 Secondary **lithium batteries** with metal compound coated electrodes. Yukita, Yasuo (Sony Corp, Japan). Jpn. Kokai Tokkyo Koho JP 09007637 A2 19970110 Heisei, 6 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1995-151792 19950619.
AB The **batteries** use cathodes and/or **anode** having a melt sprayed porous heat resistant thermal insulator layer of metal oxide, carbide, or nitride on the side facing the other electrode. The coating prevents short circuit between the electrodes.
IT **60800-19-3**, Aluminum zirconium oxide
(melt sprayed coatings for **lithium** cobalt oxide cathodes in secondary **lithium batteries**)
RN 60800-19-3 HCAPLUS
CN Aluminum zirconium oxide (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | x | 17778-80-2 |
| Zr | x | 7440-67-7 |
| Al | x | 7429-90-5 |

IC ICM H01M010-40
ICS C23C004-10; H01M004-02
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST **lithium battery** electrode metal compd coating; short circuit prevention **lithium battery** electrode
IT **Battery** electrodes
(electrodes with melt sprayed porous heat resistant thermal insulator metal compd. coatings for secondary **lithium batteries**)
IT Carbides
Nitrides
(melt sprayed coatings for **lithium** cobalt oxide cathodes in secondary **lithium batteries**)
IT 12190-79-3, Cobalt **lithium** oxide (CoLiO2)
(cathodes with melt sprayed alumina coatings for secondary **lithium batteries**)
IT 1344-28-1, Alumina, uses **60800-19-3**, Aluminum zirconium oxide
(melt sprayed coatings for **lithium** cobalt oxide cathodes in secondary **lithium batteries**)

L47 ANSWER 26 OF 36 HCAPLUS COPYRIGHT 2003 ACS
1996:634718 Document No. 125:253083 Nonaqueous-electrolyte **batteries** with improved cathodes. Inamasu, Tokuo; Kuryama, Kazuya; Iguchi, Takaaki (Yuasa Battery Co Ltd, Japan). Jpn. Kokai Tokkyo Koho JP 08222219 A2 19960830 Heisei, 4 pp. (Japanese).

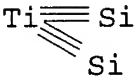
CODEN: JKXXAF. APPLICATION: JP 1995-25069 19950214.

AB The **batteries** use cathodes from alkali metal-**intercalatable** compds. having surface layers from .gtoreq.1 of compds. other than the alkali metal-**intercalatable** compds. The alkali metal-**intercalatable** compds. may be oxides having .alpha.-NaFeO2 or spinel structure. The .alpha.-NaFeO2 structure-having oxides may be LiCoO2 or LiNiO2. The spinel structure-having oxides may be LiMn2O4. The surface layers may be metal oxides, metal mixed oxides, borides, carbides, nitrides, silicides, metals, or alloys.

IT **12039-83-7**, Titanium silicide (TiSi2)
(cathodes from Li oxide coated with oxide or boride or carbide or nitride or silicide or metal for **battery**)

RN 12039-83-7 HCAPLUS

CN Titanium silicide (TiSi2) (6CI, 8CI, 9CI) (CA INDEX NAME)



IC ICM H01M004-58
ICS H01M004-02; H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST **battery** cathodes lithium oxide coating; boride coating lithium oxide cathode; carbide coating lithium oxide cathode; nitride coating lithium oxide cathode; silicide coating lithium oxide cathode; metal coating lithium oxide cathode; alloy coating lithium oxide cathode

IT Cathodes
(**battery**, cathodes from Li oxide coated with oxide or boride or carbide or nitride or silicide or metal for **battery**)

IT 12031-65-1, Lithium nickel oxide (LiNiO2) 12057-17-9, Lithium manganese oxide (LiMn2O4) 12190-79-3, Cobalt lithium oxide (CoLiO2)
(cathodes from Li oxide coated with oxide or boride or carbide or nitride or silicide or metal for **battery**)

IT 1317-61-9, Iron oxide (Fe3O4), uses 12030-49-8, Iridium oxide **12039-83-7**, Titanium silicide (TiSi2) 12045-63-5, Titanium boride 12070-08-5, Titanium carbide 25583-20-4, Titanium nitride
(cathodes from Li oxide coated with oxide or boride or carbide or nitride or silicide or metal for **battery**)

L47 ANSWER 27 OF 36 HCAPLUS COPYRIGHT 2003 ACS

1996:446644 Document No. 125:91280 Secondary lithium **battery**. Kobayashi, Naoya; Kawakami, Soichiro; Mishina, Shinya; Asao, Masaya (Canon K. K., Japan). Ger. Offen. DE 19544909 A1 19960605, 19 pp. (German). CODEN: GWXXBX. APPLICATION: DE 1995-19544909 19951201. PRIORITY: JP 1994-299417 19941202; JP 1995-306311 19951124.

AB The **battery** anode includes Li, a Li alloy, Al, an Al alloy, or C as well as a Li-contg. metal oxide, sulfide, hydroxide, and selenide. The **battery** cathode includes a Li-**intercalatable** material contg. C, Al, a Li alloy, or an Al alloy.

IT **39458-11-2P**
(**battery** cathode contg.)

RN 39458-11-2 HCAPLUS

CN Aluminum alloy, base, Al,Ti (9CI) (CA INDEX NAME)

| Component | Component Registry Number |
|---|---|
| Al | 7429-90-5 |
| Ti | 7440-32-6 |

IC ICM H01M004-40
ICS H01M004-48; H01M004-58

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST lithium **battery** anode cathode

IT **Batteries**, secondary
(high-performance lithium)

IT 7782-42-5P, Graphite, uses 12031-95-7P, Lithium titanate (Li4Ti5O12) 12201-18-2P, Lithium molybdenum sulfide (LiMoS2) 55326-82-4P, Lithium titanium sulfide (LiTiS2)
(**battery** anode contg.)

IT 7429-90-5P, Aluminum, uses
(**battery** anode contg. porous powd.)

IT 39457-42-6P, Lithium manganese oxide **39458-11-2P**
(**battery** cathode contg.)

IT 872-50-4, N-Methylpyrrolidone, uses
(**battery** electrode contg.)

L47 ANSWER 28 OF 36 HCAPLUS COPYRIGHT 2003 ACS

1995:315390 Document No. 122:139804 A model for alloy film corrosion and prediction of resulting passive layer structures. Cocke, David L.; Dorris, Kenneth; Naugle, D. G.; Hess, Thomas R. (Department Chemistry, Lamar University, Beaumont, TX, 77710, USA). Proceedings - Electrochemical Society, 94-29(Corrosion and Reliability of Electronic Materials and Devices), 358-65 (English) 1994. CODEN: PESODO. ISSN: 0161-6374. Publisher: Electrochemical Society.

AB A new model that provides insight into alloy corrosion and allows for prediction of the resulting passive layer structures was developed by considering the **oxidn**. process as an **electrochem**. **cell** which includes the anodic reaction at the metal-oxide interface. The model includes compn. of the alloy. Ti-Cu and Ti-Al alloys are discussed to illustrate the qual. agreement with the model.

IT **11106-92-6 12617-53-7**, Aluminum 15, titanium 85 (atomic) **12633-53-3 53550-31-5** **69708-10-7**, Aluminum 87, titanium 13 (atomic) **70549-35-8**, Aluminum 40, titanium 60 (atomic)

**110633-84-6 161063-18-9**, Aluminum 69, titanium 31 (atomic)
(model for alloy film corrosion and prediction of resulting passive layer structures)

RN 11106-92-6 HCAPLUS
CN Aluminum alloy, nonbase, Al,Ti (9CI) (CA INDEX NAME)

| Component | Component Registry Number |
|---|---|
| Al | 7429-90-5 |
| Ti | 7440-32-6 |

RN 12617-53-7 HCAPLUS
CN Titanium alloy, base, Ti 91,Al 9 (9CI) (CA INDEX NAME)

| Component | Component Percent | Component Registry Number |
|---|---|---|
| Ti | 91 | 7440-32-6 |
| Al | 9 | 7429-90-5 |

RN 12633-53-3 HCAPLUS
CN Titanium alloy, base, Ti 84,Al 16 (Ti25Al) (9CI) (CA INDEX NAME)

| Component | Component Percent | Component Registry Number |
|---|---|---|
| Ti | 84 | 7440-32-6 |
| Al | 16 | 7429-90-5 |

RN 53550-31-5 HCAPLUS
CN Titanium alloy, base, Ti 64,Al 36 (9CI) (CA INDEX NAME)

| Component | Component Percent | Component Registry Number |
|---|---|---|
| Ti | 64 | 7440-32-6 |
| Al | 36 | 7429-90-5 |

RN 69708-10-7 HCAPLUS
CN Aluminum alloy, base, Al 79,Ti 21 (9CI) (CA INDEX NAME)

| Component | Component Percent | Component Registry Number |
|---|---|---|
| Al | 79 | 7429-90-5 |
| Ti | 21 | 7440-32-6 |

RN 70549-35-8 HCAPLUS
CN Titanium alloy, base, Ti 73,Al 27 (9CI) (CA INDEX NAME)

| Component | Component Percent | Component Registry Number |
|---|---|---|
| Ti | 73 | 7440-32-6 |
| Al | 27 | 7429-90-5 |

RN 110633-84-6 HCAPLUS
CN Aluminum alloy, base, Al 63,Ti 37 (9CI) (CA INDEX NAME)

| Component | Component Percent | Component Registry Number |
|---|---|---|
| Al | 63 | 7429-90-5 |
| Ti | 37 | 7440-32-6 |

RN 161063-18-9 HCAPLUS
CN Aluminum alloy, base, Al 56,Ti 44 (9CI) (CA INDEX NAME)

| Component | Component Percent | Component Registry Number |
|---|---|---|
| Al | 56 | 7429-90-5 |
| Ti | 44 | 7440-32-6 |

CC 56-10 (Nonferrous Metals and Alloys)
Section cross-reference(s): 55
IT **11106-92-6 12617-53-7**, Aluminum 15, titanium 85 (atomic) **12633-53-3** 39412-26-5 **53550-31-5** 61590-11-2, Copper 50, titanium 50 (atomic) **69708-10-7**, Aluminum 87, titanium 13 (atomic) **70549-35-8**, Aluminum 40, titanium 60 (atomic) 105178-27-6 **110633-84-6** **161063-18-9**, Aluminum 69, titanium 31 (atomic)
(model for alloy film corrosion and prediction of resulting passive layer structures)

L47 ANSWER 29 OF 36 HCAPLUS COPYRIGHT 2003 ACS
1994:659663 Document No. 121:259663 Secondary **nonaqueous** -electrolyte **battery** and its manufacture. Iwasaki, Fumiharu; Yahagi, Seiji; Sakata, Akifumi; Chinone, Kazuo; Ishikawa, Hideki; Sakai, Tsugio; Tahara, Kensuke (Seiko Instruments Inc., Japan; Seiko Electronic Components Ltd.). Eur. Pat. Appl. EP 615296 A1 19940914, 22 pp. DESIGNATED STATES: R: DE, FR, GB. (English). CODEN: EPXXDW. APPLICATION: EP 1994-301699 19940310. PRIORITY: JP 1993-49716 19930310; JP 1993-80944 19930407; JP 1993-83682 19930409; JP 1993-328379 19931224; JP 1994-6023 19940124.
AB The **battery** comprises .gtoreq.1 **anode**, a cathode, and a **nonaq**. electrolyte with **Li** ion cond., wherein a composite oxide LixSi1-yMyOz is used as an active material of the **anode**, where M represents .gtoreq.1 oxide-forming element other than alkali metals and Si (e.g., Ti, W, Mn, Fe, Ni, B, Sn, or Pb) 0 <x, 0 <y <1, and 0 <z <2. The **battery** has an enhanced high current charge and discharge

characteristic with a high voltage and high energy d. but with less deterioration due to overcharge and overdischarge, and also has a long service life.

IT **158697-62-2**, Silicon titanium oxide (Si0.75Ti0.25O)
**158697-63-3**, Silicon titanium oxide (Si0.5Ti0.5O)
**158697-64-4**, Silicon titanium oxide (Si0.25Ti0.75O)
(**anodes** for **lithium nonaq**
.-electrolyte **batteries** from **lithiated**)

RN 158697-62-2 HCAPLUS
CN Silicon titanium oxide (Si0.75Ti0.25O) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 1 | 17778-80-2 |
| Ti | 0.25 | 7440-32-6 |
| Si | 0.75 | 7440-21-3 |

RN 158697-63-3 HCAPLUS
CN Silicon titanium oxide (Si0.5Ti0.5O) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 1 | 17778-80-2 |
| Ti | 0.5 | 7440-32-6 |
| Si | 0.5 | 7440-21-3 |

RN 158697-64-4 HCAPLUS
CN Silicon titanium oxide (Si0.25Ti0.75O) (9CI) (CA INDEX NAME)

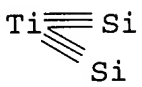
| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 1 | 17778-80-2 |
| Ti | 0.75 | 7440-32-6 |
| Si | 0.25 | 7440-21-3 |

IC ICM H01M004-48
ICS H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST **lithium nonaq** electrolyte **battery**
**anode**; titanium silicon oxide **battery**
**anode**; tungsten silicon oxide **battery**
**anode**; manganese silicon oxide **battery**
**anode**; iron silicon oxide **battery anode**;
nickel silicon oxide **battery anode**; boron
silicon oxide **battery anode**; tin silicon oxide
**battery anode**; lead silicon oxide **battery**
**anode**
IT **Batteries**, secondary
(**nonaq**.-electrolyte **lithium**)

IT **Anodes**
(**battery**, complex **lithium** oxides for)
IT 39302-36-8, **Lithium** silicon titanium oxide 158710-01-1, **Lithium** silicon tungsten oxide (Li0-1Si0.9W0.1O1.1) 158710-02-2, **Lithium** silicon tin oxide (Li0-1Si0-1Sn0-1O2) 158710-03-3, Lead **lithium** silicon oxide (Pb0-1Li0-1Si0-1O2) 158710-04-4, **Lithium** silicon borate oxide (Li0-1Si0.25-1(BO2)0-0.75O1.62-2) 158710-05-5, **Lithium** manganese silicon oxide (Li0-1Mn0-0.75Si0.25-1O2)
(**anodes** for **lithium nonaq**
.-electrolyte **batteries**)
IT 158697-57-5, Silicon tungsten oxide (Si0.9W0.1O1.1) 158697-58-6, Silicon tin oxide (Si0.9Sn0.1O) 158697-59-7, Lead silicon oxide (Pb0.1Si0.9O) 158697-60-0, Silicon borate oxide (Si0.9(BO3)0.1O0.75) 158697-61-1, Manganese silicon oxide (Mn0.5Si0.5O) **158697-62-2**, Silicon titanium oxide (Si0.75Ti0.25O) **158697-63-3**, Silicon titanium oxide (Si0.5Ti0.5O) **158697-64-4**, Silicon titanium oxide (Si0.25Ti0.75O)
(**anodes** for **lithium nonaq**
.-electrolyte **batteries** from **lithiated**)

L47 ANSWER 30 OF 36 HCAPLUS COPYRIGHT 2003 ACS
1994:283073 Document No. 120:283073 Chemical vapor deposition techniques for thin films of solid electrolytes and electrodes. van Dieten, V. E. J.; Dekker, J. P.; van Zomeren, A. A.; Schoonman, J. (Lab. Appl. Inorg. Chem., Delft Univ. Technol., Delft, 2628 BL, Neth.). NATO ASI Series, Series E: Applied Sciences, 250(Fast Ion Transport in Solids), 231-57 (English) 1993. CODEN: NAESDI. ISSN: 0168-132X.
AB Chem. vapor deposition (CVD) is a promising technol. for the fabrication of thin films for components of solid state electrochem. devices. Electrochem. vapor deposition (EVD) is a special CVD technique for the prodn. of thin gas impervious films of the solid electrolyte, yttria stabilized zirconia (YSZ) for solid oxide fuel cells (SOFC's). The kinetics of the film growth of YSZ can be modeled considering the Wagner **oxidn**. process and thermodn. equil. at the gas-solid interphases. The calcd. thermodn. equil. can be used to predict the film growth rate. The results show that the EVD growth of YSZ is most likely governed by defect transport in the EVD layer, and a mass transfer limitation at the surface on the metal chloride side. Metal org. chem. vapor deposition (MOCVD) was used for the fabrication of thin-film TiS2 cathodes for rechargeable **batteries**. The OCV of TiS2|1M LiClO4 in PC|Li **batteries**, and the chem. diffusion coeff. and thermodn. enhancement factor were detd. as a function of lithium content in these films. Electrochem. measurements include GITT and impedance spectroscopy on the cell TiS2|1M LiClO4 in PC|Li. The influence of the MOCVD conditions on the deposition rate and morphol. was investigated. The morphol. of the films seems to be independent of temp. and pressure, at 250 to 450.degree.C and total pressures of 7.5 and 20 mbar, and preferred orientation of the TiS2

crystallites.
IT **12039-83-7**, Titanium disilicide
(electrochem. vapor deposition of, for lithium **battery**)
RN 12039-83-7 HCAPLUS
CN Titanium silicide (TiSi2) (6CI, 8CI, 9CI) (CA INDEX NAME)

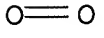


CC 72-11 (Electrochemistry)
Section cross-reference(s): 76
ST electrochem vapor deposition yttria stabilized zirconia; CVD electrochem titanium silicide lithium **battery**
IT Vapor deposition processes
(**electrochem.**, for fuel **cells** and **batteries**)
IT **Batteries**, secondary
(lithium, titanium silicide electrochem. CVD for)
IT Fuel **cells**
(solid oxide, **electrochem.** CVD processes for deposition of materials for)
IT 7439-93-2, Lithium, uses
(**battery**, electrochem. CVD of titanium silicide for)
IT 111907-48-3, Lithium titanium sulfide (Li0-1TiS2)
(characteristics of lithium **battery** contg.)
IT **12039-83-7**, Titanium disilicide
(electrochem. vapor deposition of, for lithium **battery**)
IT 7550-45-0, Titanium tetrachloride, uses
(in electrochem. vapor deposition of titanium silicide for lithium **battery**)
IT 3385-94-2
(in electrochem. vapor deposition of titanium silicide for lithium **battery**)

L47 ANSWER 31 OF 36 HCAPLUS COPYRIGHT 2003 ACS
1994:146941 Document No. 120:146941 Electropox: BP's novel **oxidation** technology. Mazanec, T. J.; Cable, T. L.; Frye, J. G., Jr. (Res. Environ. Sci. Cent., BP, Cleveland, OH, 44128, USA). Special Publication - Royal Society of Chemistry, 132(Role of Oxygen in Improving Chemical Processes), 212-25 (English) 1993. CODEN: SROCDO. ISSN: 0260-6291.
AB A cell for partial **oxidn**. of methane to synthesis gas in a process referred to as Electropox is described. Electrocatalytic methane upgrading can achieve modest yields of ethane and ethylene. Methane coupling yields are limited by the subsequent **oxidn**. of C2 products. High temp. methane upgrading to synthesis gas via an electrocatalytic process (Electropox) can result in high yields of CO. High oxygen fluxes are able to be obtained in externally short circuited cells. Dual phase, internally short circuited

membranes can be fabricated that give high oxygen flux.

IT **7782-44-7**, Oxygen, uses
(in carbon monoxide electroprodn. from methane)
RN 7782-44-7 HCAPLUS
CN Oxygen (8CI, 9CI) (CA INDEX NAME)



IT **145270-17-3**, Indium 90, praseodymium 10 (atomic)
(membrane contg., dual phase, oxygen flux in, hydrogen feed and methane conversion in relation to)
RN 145270-17-3 HCAPLUS
CN Indium alloy, base, In 88,Pr 12 (9CI) (CA INDEX NAME)

| Component | Component Percent | Component Registry Number |
|---|---|---|
| In | 88 | 7440-74-6 |
| Pr | 12 | 7440-10-0 |

CC 72-2 (Electrochemistry)
Section cross-reference(s): 23
ST methane Electropox electrocatalytic **oxidn**; carbon monoxide prodn methane electrocatalytic **oxidn**; ethane electrochem prodn methane; ethylene electrochem prodn methane
IT **Electrolytic cells**
(for methane **oxidn**.)
IT **Oxidation**, electrochemical
(of methane)
IT 7440-69-9, Bismuth, uses
(anode from silver doped with, for methane coupling and **oxidn**.)
IT 7440-22-4, Silver, uses
(anode, bismuth-doped, for methane coupling and **oxidn**.)
IT 124-38-9P, Carbon dioxide, preparation 630-08-0P, Carbon monoxide, preparation
(formation of, in **oxidn**. of methane in Electropox electrocatalytic process)
IT **7782-44-7**, Oxygen, uses
(in carbon monoxide electroprodn. from methane)
IT 125297-88-3, Chromium lanthanum magnesium oxide **145270-17-3** ; Indium 90, praseodymium 10 (atomic) 145270-18-4, Indium 95, praseodymium 2.5, zirconium 2.5 (atomic)
(membrane contg., dual phase, oxygen flux in, hydrogen feed and methane conversion in relation to)
IT 74-82-8, Methane, reactions
(**oxidn**. of, electrocatalytic, Electropox process in)

L47 ANSWER 32 OF 36 HCAPLUS COPYRIGHT 2003 ACS
1993:47892 Document No. 118:47892 Electrocatalytic cells for chemical

reaction. Mazanec, T. J.; Cable, T. L.; Frye, J. G., Jr. (BP Res., Cleveland, OH, 44128, USA). Solid State Ionics, 53-56(Pt. 1), 111-18 (English) 1992. CODEN: SSIOD3. ISSN: 0167-2738.

AB Solid-oxide fuel cell technol. was successfully applied to the partial **oxidn**. of CH4 to produce ethane and ethylene and to the oxydehydrogenation of ethane to produce ethylene. One electrocatalytic cell consists of a solid-electrolyte (Y2O3-stabilized ZrO2) coated on either side with a conductive metal to form electrodes. Air is passed over 1 side of the cell where it reacts with the cathode to form oxygen anions. The oxygen anions are transported through the ZrO2 to the anode where they **oxidize** the substrate. The cathode and anode are connected by an external circuit so that a current is generated. The choice of electrocatalyst on the anode affects the product selectivity. In the partial **oxidn**. of CH4, high selectivities to C2+ were obtained by using doped Ag or Au anodes. At 800.degree., under conditions of low conversion, the selectivity to C2+ was as high as 86% for a AgPb anode. In all cases, selectivity decreases with increasing conversion. The highest yield was obtained with the AgPb anode at 850.degree.. Co-feed expts. using CH4-C2H4 mixts. shed light on the limit of the CH4 coupling yield. An advanced cell concept incorporating a 2nd, conducting phase along with an O-conducting electrolyte to produce an internal short circuit is described. High O fluxes (c.d.) were measured that may permit these materials to be used as O sepg. membranes in chem. reactors.

IT **7782-44-7**, Oxygen, uses
(in fuel cell, for methane and ethene conversion)

RN 7782-44-7 HCAPLUS

CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O═O

IT **145270-17-3**, Indium 90, praseodymium 10 (atomic)
(membrane with, in fuel cell for methane and ethane conversion)

RN 145270-17-3 HCAPLUS

CN Indium alloy, base, In 88,Pr 12 (9CI) (CA INDEX NAME)

| Component | Component Percent | Component Registry Number |
|---|---|---|
| In | 88 | 7440-74-6 |
| Pr | 12 | 7440-10-0 |

CC 72-3 (Electrochemistry)
Section cross-reference(s): 23, 52

ST methane **oxidn electrochem** fuel **cell**; ethylene ethane formation methane conversion; ethane dehydrogenation fuel cell; electrode activation metal fuel cell

IT **Oxidation**, electrochemical
(of methane in fuel cells, ethane and ethylene formation in)

IT 74-85-1P, Ethylene, preparation
(formation of, in fuel cell, during **oxidn**. of methane and dehydrogenation of ethane)
IT **7782-44-7**, Oxygen, uses 16833-27-5, Oxide
(in fuel cell, for methane and ethene conversion)
IT 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 125297-88-3, Chromium lanthanum magnesium oxide **145270-17-3**, Indium 90, praseodymium 10 (atomic) 145270-18-4, Indium 95, praseodymium 2.5, zirconium 2.5 (atomic)
(membrane with, in fuel cell for methane and ethane conversion)
IT 74-82-8, Methane, reactions
(**oxidn**. of, **electrochem**.,in fuel **cell**, ethane and ethylene formation in)

L47 ANSWER 33 OF 36 HCAPLUS COPYRIGHT 2003 ACS
1992:132778 Document No. 116:132778 **Batteries** with **nonaqueous** electrolytes containing aluminum salts. Ishibashi, Chikanori; Nishio, Koji; Furukawa, Sanehiro (Sanyo Electric Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 03219561 A2 19910926 Heisei, 6 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1990-14201 19900123.
AB The **batteries** comprise Al (alloy) anodes, cathodes, and **nonaq**. electrolytes of Al salts (as solvents and solutes) contg. metal salts additives which inhibit passivation of Al. The **batteries** have high discharge capacity and excellent storage properties. NaAlO2 was used as the additive in AlCl3/propylene carbonate electrolyte solns. in Al/MnO2 **batteries**.
IT **12522-92-8**, Aluminum lanthanum oxide (Al3LaO6)
(electrolytes contg., aluminum salt, for aluminum/manganese dioxide **batteries**)
RN 12522-92-8 HCAPLUS
CN Aluminum lanthanum oxide (Al3LaO6) (8CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 6 | 17778-80-2 |
| La | 1 | 7439-91-0 |
| Al | 3 | 7429-90-5 |

IC ICM H01M006-16
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST aluminum manganese dioxide **battery** electrolyte; sodium aluminate electrolyte aluminum **battery**; aluminum chloride **battery** electrolyte additive
IT **Battery** electrolytes
(aluminum salts, aluminate additives in, for preventing passivation of aluminum anodes)
IT **Batteries**, primary
(aluminum/manganese dioxide, aluminate additives in, for preventing passivation of anodes)
IT 7429-90-5, Aluminum, uses

(anodes, passivation of, electrolytes contg. aluminate additives for preventing, in **batteries**)

IT 1302-42-7, Sodium aluminate (NaAlO2) 1333-88-6, Aluminum cobalt oxide (Al2CoO4) 12003-63-3, Potassium aluminate (KAlO2) 12004-04-5, Barium aluminate {Ba(AlO2)2] 12004-37-4 12042-68-1, Calcium aluminate [Ca(AlO2)2] 12068-51-8, Magnesium aluminate [Mg(AlO2)2] **12522-92-8**, Aluminum lanthanum oxide (Al3LaO6)
(electrolytes contg., aluminum salt, for aluminum/manganese dioxide **batteries**)

IT 7446-70-0, Aluminum chloride, uses 14403-54-4 14452-39-2, Aluminum perchlorate
(electrolytes, contg. aluminate additives, for aluminum/manganese dioxide **batteries**)

L47 ANSWER 34 OF 36 HCAPLUS COPYRIGHT 2003 ACS

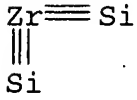
1988:476602 Document No. 109:76602 Electrolyte matrix for phosphoric-acid fuel cell. Takahashi, Kenzo; Shimamoto, Kozo; Miyojin, Shunichi; Watai, Hisao; Nakajo, Hiroshi; Ido, Takeo (Mitsubishi Electric Corp., Japan). Jpn. Kokai Tokkyo Koho JP 63029457 A2 19880208 Showa, 5 (Japanese). CODEN: JKXXAF. APPLICATION: JP 1986-174171 19860723.

AB Corrosion-resistant non-oxide materials are surface **oxidized** for used as the electrolyte matrix for H3PO4 fuel cells. Preferable materials are SiC, Si3N4, ZrSi2, NbSi2, YB4, TaB2, NbC, TaC, NbP, Fe3C, Fe3P, and CoSi2. Thus, SiC powder was treated at 1200.degree.for 1 h, to form a 0.01-.mu. SiO2 surface layer. A paste contg. the treated SiC and 5% wt. PTFE was applied on a gas-diffusion electrode, and baked at 340.degree. to form a 150-.mu. matrix layer. This layer had a contact angle of 85 .degree. with H3PO4, a H3PO4 permeation rate of 4 mm/h1/2, a pore size of 0.24.mu., a bubbling pressure of 1.2 Kg/cm2, and a current-resistance drop of 20 mV, vs. 210 .mu., 118.degree., 0 mm/h1/2, 0.24.mu., 0.4 Kg/cm2, and 36 mV, for an untreated SiC layer.

IT **12039-90-6**, Zirconium silicide (ZrSi2)
(electrolyte matrix from surface-**oxidized**, for phosphoric-acid fuel cells)

RN 12039-90-6 HCAPLUS

CN Zirconium silicide (ZrSi2) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



IC ICM H01M008-02

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST fuel **cell electrolyte** matrix material; silicon carbide **oxidized** electrolyte matrix

IT Fuel **cells**
(phosphoric-acid, **electrolyte** matrixes from surface-

**oxidized** non-oxide materials for)
IT 409-21-2, Silicon carbide (SiC), uses and miscellaneous
12007-35-1, Tantalum boride (TaB2) 12011-67-5, Iron carbide (Fe3C)
12017-12-8, Cobalt silicide (CoSi2) 12023-53-9, Iron phosphide
(Fe3P) 12033-89-5, Silicon nitride (Si3N4), uses and miscellaneous
12034-66-1, Niobium phosphide (NbP) 12034-80-9, Niobium silicide
(NbSi2) **12039-90-6**, Zirconium silicide (ZrSi2)
12045-95-3, Yttrium boride (YB4) 12069-94-2, Niobium carbide (NbC)
12070-06-3, Tantalum carbide (TaC)
(electrolyte matrix from surface-**oxidized**, for
phosphoric-acid fuel cells)

L47 ANSWER 35 OF 36 HCAPLUS COPYRIGHT 2003 ACS
1972:18737 Document No. 76:18737 Thermodynamic study of
lanthanum-antimony system alloys by an emf method La4Sb3, La5Sb3,
and La2Sb. Goryacheva, V. I.; Nikol'skaya, A. V.; Gerasimov, Ya. I.
(Mosk. Gos. Univ. im. Lomonosova, Moscow, USSR). Doklady Akademii
Nauk SSSR, 199(3), 632-4 [Phys Chem] (Russian) 1971. CODEN: DANKAS.
ISSN: 0002-3264.
AB The emf. of **cells** with liq. **electrolytes** making
use of alloys of La-Sb with various compns. and operating in the
380-525.degree. interval were used to obtain the various
thermodynamic functions for La-Sb system. No confirmation of La3Sb2
compd. could be had while La4Sb3 and La5Sb3 were confirmed, but the
latter is not stable and **oxidizes** very easily. La2Sb
exists and forms tetragonal crystals. Values of Gibbs integral
energy, enthalpy, and entropy of the above 3 compds. were tabulated.
The Gibbs energy and enthalpy values were similar for all 3
substances, with La4Sb3 having the largest Gibbs energy change in
formation from solid components.
IT **12740-24-8**
(thermodynamics of lanthanum antimonides in)
RN 12740-24-8 HCAPLUS
CN Lanthanum alloy, base, La 57-70,Sb 30-43 (9CI) (CA INDEX NAME)

| Component | Component Percent | Component Registry Number |
|---|---|---|
| La | 57 - 70 | 7439-91-0 |
| Sb | 30 - 43 | 7440-36-0 |

IT **12057-10-2 12263-20-6 12339-69-4**
(thermodynamics of, in lanthanum-antimony alloys)
RN 12057-10-2 HCAPLUS
CN Antimony, compd. with lanthanum (3:4) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Sb | 3 | 7440-36-0 |
| La | 4 | 7439-91-0 |

RN 12263-20-6 HCAPLUS
CN Antimony, compd. with lanthanum (2:1) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Sb | 2 | 7440-36-0 |
| La | 1 | 7439-91-0 |

RN 12339-69-4 HCAPLUS
CN Antimony, compd. with lanthanum (3:5) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Sb | 3 | 7440-36-0 |
| La | 5 | 7439-91-0 |

CC 69 (Thermodynamics, Thermochemistry, and Thermal Properties)
IT **12740-24-8**
(thermodynamics of lanthanum antimonides in)
IT **12057-10-2 12263-20-6 12339-69-4**
(thermodynamics of, in lanthanum-antimony alloys)

L47 ANSWER 36 OF 36 HCAPLUS COPYRIGHT 2003 ACS
1971:457651 Document No. 75:57651 Engineering development studies for molten-salt breeder reactor processing. 1. McNeese, L. E. (Oak Ridge Natl. Lab., Oak Ridge, TN, USA). U. S. At. Energy Comm., ORNL-TM-3053, 85 pp. Avail. Dep. NTIS From: Nucl. Sci. Abstr. 1971, 25(3), 4138 (English) 1970. CODEN: XAERAK.
AB Equipment was installed to permit engineering studies on reductive extn. in countercurrent contactors. The system will allow countercurrent contact of up to 15 l. each of molten salt and Bi at flow rates of 0.05-0.5 l./min. The contactor presently being studied is a 0.82-in. inside diam., 2-ft-long column (excluding end sections) that is packed with solid 1/4-in. right circular cylinders of Mo. The flowsheet under consideration for processing fuel from the proposed MSBR uses an **electrolytic cell**. Fluorides of Th or Li in a molten-salt stream are reduced at the Bi cathode, while metals that are extd. into Bi are **oxidized** at the Bi anode. The feasibility of sepg. rare earths from Th in a Bi soln. by fractional crystn. of ThBi2 was examd. A possible equipment configuration was considered, and an anal. was made of factors affecting the fraction of ThBi2 that could be potentially recovered. A computer code, MATADOR, was developed to perform steady-state material-balance calcns. that describe the nuclear, chem., and phys. processes occurring in the fuel stream of an MSBR. This code allows the effects of chem. processing on the nuclear performance of an MSBR to be investigated, fission-product inventories and heat-generation rates to be detd., and flow rates of streams in the chem. processing plant to be specified. The buildup of transuranium isotopes, the production of activation products by n

capture in the carrier salt, and chain-branching in the decay fission products are considered. The MATADOR code was used to compute inventories and heat-generation rates in the fuel stream of a 1000-MW (elec.) single-fluid MSBR; this information is summarized for the ref. reactor.

IT **12409-39-1**
(crystallization of, recovery of thorium from nuclear reactor molten salt fuels in relation to fractional)

RN 12409-39-1 HCAPLUS

CN Bismuth, compd. with thorium (2:1) (6CI, 8CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Bi | 2 | 7440-69-9 |
| Th | 1 | 7440-29-1 |

CC 76 (Nuclear Technology)

IT **Electrolytic cells**
(for processing of irradiated nuclear reactor molten salt fuels)

IT **12409-39-1**
(crystallization of, recovery of thorium from nuclear reactor molten salt fuels in relation to fractional)

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L48 ANSWER 1 OF 14 HCAPLUS COPYRIGHT 2003 ACS

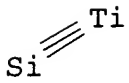
2002:962339 Document No. 138:58874 **Nonaqueous** electrolyte secondary **battery** with porous **negative electrode**. Bito, Yasuhiko; Kasamatsu, Shinji; Nitta, Yoshiaki (Matsushita Electric Industrial Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2002367602 A2 20021220, 11 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2001-170588 20010606.

AB A **neg. electrode** in a **nonaq.** electrolyte secondary **battery** comprises a metal or alloy capable of absorbing and desorbing **Li**, the porosity of the **neg. electrode** being 50-90 vol.%. The metal is preferably Al, Si, or Sn, and the alloy is LixTi.alpha.Sn.beta.Si.gamma. (x .ltoreq.10, .alpha. = 0.1-10, .beta. = 0.1-10, and .gamma. = 0.1-30) and preferably contains CoSn or Cu5Sn. The **neg. electrode** active mass may be in the form of a porous layer plated on a substrate. The **neg. electrode** has a long cycle life which results in a longer cycle life and higher reliability of the **battery**.

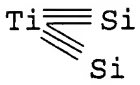
IT **12039-70-2**, Titanium silicide tisi **12039-83-7**, Titanium disilicide **12166-63-1 12510-35-9**, Snti2
(cathode contg.; **nonaq.** electrolyte secondary **battery** with porous **neg. electrode**)

RN 12039-70-2 HCAPLUS

CN Titanium silicide (TiSi) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



RN 12039-83-7 HCAPLUS
CN Titanium silicide (TiSi2) (6CI, 8CI, 9CI) (CA INDEX NAME)



RN 12166-63-1 HCAPLUS
CN Tin, compd. with titanium (5:6) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Ti | 6 | 7440-32-6 |
| Sn | 5 | 7440-31-5 |

RN 12510-35-9 HCAPLUS
CN Tin, compd. with titanium (1:2) (8CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Ti | 2 | 7440-32-6 |
| Sn | 1 | 7440-31-5 |

IT **77137-25-8**, Titanium silicide ti2si
(**nonaq**. electrolyte secondary **battery** with porous **neg**. **electrode**)
RN 77137-25-8 HCAPLUS
CN Titanium silicide (Ti2Si) (7CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Ti | 2 | 7440-32-6 |
| Si | 1 | 7440-21-3 |

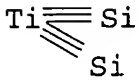
IC ICM H01M004-02
ICS H01M004-40; H01M004-80; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST **nonaq** electrolyte secondary **battery** porous **neg electrode**; aluminum silicon tin porous

**neg electrode lithium battery**
IT Secondary **batteries**
(**lithium**; **nonaq**. electrolyte secondary **battery** with porous **neg**. **electrode**)
IT **Battery** cathodes
Porosity
Porous materials
(**nonaq**. electrolyte secondary **battery** with porous **neg**. **electrode**)
IT 7429-90-5, Aluminum, uses 7440-21-3, Silicon, uses 7440-31-5, Tin, uses **12039-70-2**, Titanium silicide tisi **12039-83-7**, Titanium disilicide **12166-63-1** **12510-35-9**, Snti2
(cathode contg.; **nonaq**. electrolyte secondary **battery** with porous **neg**. **electrode**)
IT 12019-69-1 12297-65-3 **77137-25-8**, Titanium silicide ti2si 479065-20-8
(**nonaq**. electrolyte secondary **battery** with porous **neg**. **electrode**)

L48 ANSWER 2 OF 14 HCAPLUS COPYRIGHT 2003 ACS
2002:238073 Document No. 136:265793 Manufacture of **anode** active mass for secondary **nonaqueous** electrolyte **battery**. Nakamoto, Takayuki; Sato, Toshitada; Shimamura, Harushige; Okamura, Kazuhiro (Matsushita Electric Industrial Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2002093412 A2 20020329, 7 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-276915 20000912.
AB The **anode** is prepd. by filling a raw material, contg. .gtoreq.1 Group 2-11 metal and .gtoreq.1 Group 13-15 element, in a mold having a bent through hole bending .ltoreq.180.degree., and pushing the material through the hole by a rod while applying a shearing force to the mixt.
IT **12003-96-2P**, AlTi **12039-83-7P**, Titanium silicide (TiSi2) **12510-35-9P**, SnTi2 **210885-32-8P**
(manuf. of **anode** active mass by applying shearing force on raw material for secondary **lithium batteries**)
RN 12003-96-2 HCAPLUS
CN Aluminum, compd. with titanium (1:1) (8CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Ti | 1 | 7440-32-6 |
| Al | 1 | 7429-90-5 |

RN 12039-83-7 HCAPLUS
CN Titanium silicide (TiSi2) (6CI, 8CI, 9CI) (CA INDEX NAME)



RN 12510-35-9 HCAPLUS
CN Tin, compd. with titanium (1:2) (8CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Ti | 2 | 7440-32-6 |
| Sn | 1 | 7440-31-5 |

RN 210885-32-8 HCAPLUS
CN Tin, compd. with titanium (1:1) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Ti | 1 | 7440-32-6 |
| Sn | 1 | 7440-31-5 |

IC ICM H01M004-38
ICS H01M004-02; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST secondary **battery anode** active mass manuf
shearing force
IT **Battery anodes**
(manuf. of **anode** active mass by applying shearing force on raw material for secondary **lithium batteries**)
IT **12003-96-2P**, AlTi 12032-53-0P **12039-83-7P**, Titanium silicide (TiSi2) 12054-11-4P, CuSn 12201-89-7P, Nickel silicide (NiSi2) 12509-20-5P **12510-35-9P**, SnTi2 12763-92-7P 55071-50-6P **210885-32-8P** 264124-74-5P 405234-66-4P
(manuf. of **anode** active mass by applying shearing force on raw material for secondary **lithium batteries**)

L48 ANSWER 3 OF 14 HCAPLUS COPYRIGHT 2003 ACS
2001:796591 Document No. 135:346872 **Anode** active mass for secondary **nonaqueous** electrolyte **batteries** and its manufacture. Takeshita, Yukiteru; Kamishiro, Koichi; Negi, Noriyuki; Uenaka, Hideya; Kohiyori, Motoji; Nitta, Yoshiaki; Shimamura, Harushige; Okamura, Kazuhiro (Sumitomo Metal Industries Ltd., Japan; Matsushita Electric Industrial Co., Ltd.). Jpn. Kokai Tokkyo Koho JP 2001307723 A2 20011102, 8 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-118648 20000419.
AB The **anode** active mass contains an alloy having a 1st group

of phases of elements, capable of reversibly bonding with **Li**, and a 2nd group of phases contg. .gtoreq.1 element in the 1st group and .gtoreq.1 Group IIA, IIIA, IVA and transition metals, and contains **Li** added before the solidification of the alloy. The active mass is prepd. by adding a **Li** source to a melt of the alloy components and solidifying the alloy.

IT **264609-25-8 371921-03-8**
(structure and manuf. of multiphase **lithium** alloying **anode** active mass for secondary **lithium batteries**)

RN 264609-25-8 HCAPLUS
CN Silicon alloy, base, Si 63,Ti 37 (9CI) (CA INDEX NAME)

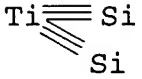
| Component | Component Percent | Component Registry Number |
|---|---|---|
| Si | 63 | 7440-21-3 |
| Ti | 37 | 7440-32-6 |

RN 371921-03-8 HCAPLUS
CN Neodymium alloy, base, Nd 63,Si 37 (9CI) (CA INDEX NAME)

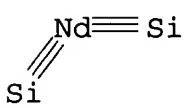
| Component | Component Percent | Component Registry Number |
|---|---|---|
| Nd | 63 | 7440-00-8 |
| Si | 37 | 7440-21-3 |

IT **12039-83-7**, Titanium silicide (TiSi2) **12137-04-1**, Neodymium silicide (NdSi2)
(structure and manuf. of multiphase **lithium** alloying **anode** active mass for secondary **lithium batteries**)

RN 12039-83-7 HCAPLUS
CN Titanium silicide (TiSi2) (6CI, 8CI, 9CI) (CA INDEX NAME)




RN 12137-04-1 HCAPLUS
CN Neodymium silicide (NdSi2) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)




IC ICM H01M004-38

ICS C22C001-02; C22C030-00; H01M004-02; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST **battery lithium** alloy **anode** compn manuf
IT **Battery anodes**
(structure and manuf. of multiphase **lithium** alloying **anode** active mass for secondary **lithium batteries**)
IT 7439-93-2, **Lithium**, uses
(structure and manuf. of multiphase **lithium** alloying **anode** active mass for secondary **lithium batteries**)
IT 81572-78-3 139530-68-0 165723-76-2 190664-12-1 259750-77-1
**264609-25-8** 371921-00-5 371921-01-6 371921-02-7
**371921-03-8** 371921-04-9 371921-05-0 371921-06-1
371921-07-2 371921-08-3 371921-09-4 371921-10-7 371921-11-8
371921-12-9 371921-13-0
(structure and manuf. of multiphase **lithium** alloying **anode** active mass for secondary **lithium batteries**)
IT 7440-21-3, Silicon, miscellaneous 11099-22-2 11148-21-3
12017-12-8, Cobalt silicide (CoSi2) 12022-99-0, Iron silicide (FeSi2) 12035-57-3, NiSi **12039-83-7**, Titanium silicide (TiSi2) 12039-87-1, Vanadium silicide (VSi2) 12039-88-2, Tungsten silicide (WSi2) **12137-04-1**, Neodymium silicide (NdSi2) 12201-89-7, Nickel silicide (NiSi2) 12394-61-5
53095-77-5, Magnesium silicide (MgSi2) 71818-44-5 125694-24-8
(structure and manuf. of multiphase **lithium** alloying **anode** active mass for secondary **lithium batteries**)

L48 ANSWER 4 OF 14 HCAPLUS COPYRIGHT 2003 ACS
2001:796403 Document No. 135:346864 Cathode for **nonaqueous** electrolyte **lithium** ion **battery**. Yamada, Atsuo; Yamahira, Takayuki (Sony Corporation, Japan). Eur. Pat. Appl. EP 1150368 A2 20011031, 26 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO. (English). CODEN: EPXXDW. APPLICATION: EP 2001-109919 20010424. PRIORITY: JP 2000-128998 20000425.
AB The **lithium** ion cell is improved appreciably in operational stability under special conditions, such as high temps., and exhibits superior characteristics against over-discharging, while guaranteeing compatibility to the operating voltage of a conventional **lithium** ion cell and an energy d. equiv. to that of the conventional **lithium** ion cell. To this end, the **lithium** ion cell includes a pos. **electrode**, a **neg. electrode** and a **nonaq.** electrolyte, and uses, as a pos. electrode active material, a composite material of a first **lithium** compd. represented by the general formula LixMyPO4, where 0 <x< 2, 0.8 <y< 1.2 and M contains Fe, and a second **lithium** compd. having a potential holder than the potential of the first **lithium**

compd.
IT **12039-83-7**, Titanium silicide TiSi2
(cathode for **nonaq**. electrolyte **lithium** ion **battery**)
RN 12039-83-7 HCAPLUS
CN Titanium silicide (TiSi2) (6CI, 8CI, 9CI) (CA INDEX NAME)

IC ICM H01M004-58
ICS C01G049-00; C01B025-30; C01B025-45; H01M004-38
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST **lithium nonaq** electrolyte cathode
IT Charcoal
(activated; cathode for **nonaq**. electrolyte **lithium** ion **battery**)
IT **Battery** cathodes
(cathode for **nonaq**. electrolyte **lithium** ion **battery**)
IT Carbon fibers, uses
Carbonaceous materials (technological products)
Coke
Petroleum coke
(cathode for **nonaq**. electrolyte **lithium** ion **battery**)
IT Carbon black, uses
(cathode for **nonaq**. electrolyte **lithium** ion **battery**)
IT Fluoropolymers, uses
(cathode for **nonaq**. electrolyte **lithium** ion **battery**)
IT Organic compounds, uses
(high mol., sintered; cathode for **nonaq**. electrolyte **lithium** ion **battery**)
IT Secondary **batteries**
(**lithium**; cathode for **nonaq**. electrolyte **lithium** ion **battery**)
IT Coke
(needle; cathode for **nonaq**. electrolyte **lithium** ion **battery**)
IT Coke
(pitch; cathode for **nonaq**. electrolyte **lithium** ion **battery**)
IT Furan resins
Phenolic resins, uses
(sintered and carbonized; cathode for **nonaq**. electrolyte **lithium** ion **battery**)
IT 50-21-5D, Lactic acid, ester 60-29-7, Diethyl ether, uses

64-19-7D, Acetic acid, ester, uses 75-05-8, Acetonitrile, uses 79-09-4D, Propionic acid, ester 96-47-9, 2-Methyltetrahydrofuran 96-48-0 96-49-1, Ethylene carbonate 100-66-3, Anisole, uses 105-58-8, Diethyl carbonate 107-12-0, Propionitrile 108-32-7, Propylene carbonate 109-99-9, Thf, uses 110-71-4, 1,2-Dimethoxyethane 126-33-0, Sulfolane 409-21-2, Silicon carbide sic, uses 554-12-1, Methyl propionate 616-38-6, Dimethyl carbonate 623-42-7, Methyl butyrate 623-96-1, Dipropyl carbonate 629-14-1, 1,2-Diethoxyethane 646-06-0, 1,3-Dioxolane 872-36-6, Vinylene carbonate 1072-47-5, 4-Methyl-1,3-dioxolane 1313-08-2 2550-62-1, **Lithium** methanesulfonate 4437-85-8, Butylene carbonate 7439-93-2, **Lithium**, uses 7440-50-8, Copper, uses 7447-41-8, **Lithium** chloride, uses 7550-35-8, **Lithium** bromide 7782-42-5, Graphite, uses 7791-03-9, **Lithium** perchlorate 9003-07-0, Polypropylene 12007-81-7, Silicon tetraboride 12008-29-6, Silicon hexaboride 12013-56-8, Calcium disilicide 12017-12-8, Cobalt disilicide 12018-09-6, Chromium disilicide 12022-99-0, Iron disilicide 12032-86-9, Manganese disilicide 12033-76-0, Silicon nitride oxide Si2N2O 12033-89-5, Silicon nitride, uses 12034-80-9, Niobium disilicide 12039-79-1, Tantalum disilicide **12039-83-7**, Titanium silicide TiSi2 12039-87-1, Vanadium disilicide 12039-88-2, Tungsten disilicide 12059-14-2, Nickel silicide (Ni2Si) 12136-78-6, Molybdenum disilicide 12159-07-8, Copper silicide cu5si 12190-79-3, Cobalt **lithium** oxide colio2 12201-89-7, Nickel disilicide 14283-07-9, **Lithium** tetrafluoroborate 14485-20-2, **Lithium** tetraphenylborate 15365-14-7, Iron **lithium** phosphate FeLiPO4 19414-36-9, Iron **lithium** manganese phosphate ((Fe,Mn)**Li**(PO4)) 21324-40-3, **Lithium** hexafluorophosphate 22831-39-6, Magnesium silicide (Mg2Si) 29935-35-1, **Lithium** hexafluoroarsenate 33454-82-9, **Lithium** trifluoromethanesulfonate 35678-71-8, Methylsulfolane 90076-65-6 113066-89-0, Cobalt **lithium** nickel oxide Co0.2LiNi0.8O2 113671-38-8, Silicon oxide SiO0-2 160479-36-7, **Lithium** tin oxide 178958-56-0, **Lithium** silicon oxide 300858-61-1 339333-78-7, Zinc silicide ZnSi2 371148-86-6, Tin oxide (SnO0-2) 371148-87-7, **Lithium** magnesium manganese oxide (LiMg0.2Mn0.8O2)
(cathode for **nonaq**. electrolyte **lithium** ion **battery**)

IT 24937-79-9, Pvdf
(cathode for **nonaq**. electrolyte **lithium** ion **battery**)

IT 7440-44-0, Carbon, uses
(pyrocarbon; cathode for **nonaq**. electrolyte **lithium** ion **battery**)

L48 ANSWER 5 OF 14 HCAPLUS COPYRIGHT 2003 ACS
2001:760453 Document No. 135:320486 Silicon alloy **anode** material for secondary **nonaqueous**-electrolyte **lithium battery** and its manufacture. Yamamoto,

Hiroyoshi; Negi, Noriyuki; Kohiyori, Motoharu; Takeshita, Yukiteru; Yonemura, Koji; Nitta, Yoshiaki; Shimamura, Harushige; Okamura, Kazuhiro (Sumitomo Metal Industries Ltd., Japan; Matsushita Electric Industrial Co., Ltd.). Jpn. Kokai Tokkyo Koho JP 2001291514 A2 20011019, 9 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-104833 20000406.

AB The **anode** material contains Si phase and intermetallic compd. phase comprising Si and .gtoreq.1 metal element selected from Group IIA elements in long form of the periodic table and transition metals (preferably selected from Mg, Ti, V, Cr, Mn, Co, Cu, Fe, and Ni). The **anode** material has columnar crystal structure with av. content .gtoreq.10 area% to the cross section in the longer direction of the columnar crystal, and av. grain size of the minor axis of the intermetallic compd. phase excluding eutectic crystals is .ltoreq.100 .mu.m. Raw materials are melted and the resulting alloy melt with a controlled compn. is solidified by strip casting or centrifugal casting for manufg. the **anode** material. The **anode** material has high discharge capacity and long cycle life.

IT **108364-28-9P**
(manuf. of Si alloy **anode** material with columnar structure contg. intermetallic compd. phase for **nonaq** .-electrolyte **Li battery**)

RN 108364-28-9 HCAPLUS

CN Silicon alloy, base, Si 59,Ti 41 (9CI) (CA INDEX NAME)

| Component | Component Percent | Component Registry Number |
|---|---|---|
| Si | 59 | 7440-21-3 |
| Ti | 41 | 7440-32-6 |

IC ICM H01M004-38
ICS B22F009-10; H01M004-02; H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56

ST silicon alloy **anode** intermetallic compd phase **nonaq** electrolyte **battery**; columnar structure silicon alloy **anode battery** discharge capacity

IT **Battery anodes**
(manuf. of Si alloy **anode** material with columnar structure contg. intermetallic compd. phase for **nonaq** .-electrolyte **Li battery**)

IT Intermetallic compounds
(manuf. of Si alloy **anode** material with columnar structure contg. intermetallic compd. phase for **nonaq** .-electrolyte **Li battery**)

IT **108364-28-9P** 117603-07-3P 119470-43-8P 150361-13-0P 169217-08-7P 215672-49-4P 367926-47-4P 367926-48-5P 367926-49-6P 367926-52-1P 367926-53-2P 367926-54-3P
(manuf. of Si alloy **anode** material with columnar structure contg. intermetallic compd. phase for **nonaq**

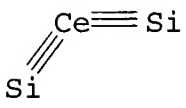
.-electrolyte **Li battery**)

L48 ANSWER 6 OF 14 HCAPLUS COPYRIGHT 2003 ACS
2001:692228 Document No. 135:259779 Silicon-tin-based alloy for **battery anode**, its manufacture by rapid cooling, and **nonaqueous** electrolyte secondary **battery** using it. Shimamura, Harushige; Nitta, Yoshiaki; Negi, Noriyuki; Uenaka, Hideya (Matsushita Electric Industrial Co., Ltd., Japan; Sumitomo Metal Industries Ltd.). Jpn. Kokai Tokkyo Koho JP 2001256974 A2 20010921, 12 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-65572 20000309.

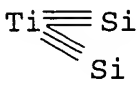
AB The alloy, whose surface oxide film is removed, comprises (1) an A phase contg. Si and/or Si surrounded with a B phase contg. intermetallic compds. or solid solns. of Si or Sn with .gtoreq.1 other element selected from Group 2A, 3B-2B transition metal, 3A, 4A except C, and 5A elements on the long-form periodic table or (2) a Si phase surrounded with a Sn phase. The alloy is manufd. by (1) cooling a Si-Sn molten alloy at .gtoreq.100 degree/s, followed by immersing in an aq. acidic soln. The **battery** uses the above alloy as an **anode**. The **battery** shows high discharge capacity, energy-conversion efficiency, and long cycle life.

IT **12014-85-6**, Cerium silicide (CeSi2) **12039-83-7**, Titanium silicide (TiSi2) **12066-83-0**, Praseodymium silicide (PrSi2) **12137-04-1**, Neodymium silicide (NdSi2) **12166-63-1**
(**anode** alloy contg.; manuf. of silicon-tin-based alloy for **nonaq**. electrolyte secondary **battery** **anode** by rapid cooling)

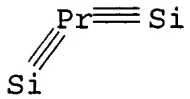
RN 12014-85-6 HCAPLUS
CN Cerium silicide (CeSi2) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



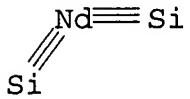
RN 12039-83-7 HCAPLUS
CN Titanium silicide (TiSi2) (6CI, 8CI, 9CI) (CA INDEX NAME)



RN 12066-83-0 HCAPLUS
CN Praseodymium silicide (PrSi2) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



RN 12137-04-1 HCAPLUS
CN Neodymium silicide (NdSi2) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



RN 12166-63-1 HCAPLUS
CN Tin, compd. with titanium (5:6) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Ti | 6 | 7440-32-6 |
| Sn | 5 | 7440-31-5 |

IT **361445-72-9**
(manuf. of silicon-tin-based alloy for **nonaq.** electrolyte secondary **battery anode** by rapid cooling)
RN 361445-72-9 HCAPLUS
CN Tin alloy, base, Sn 74,Ti 26 (9CI) (CA INDEX NAME)

| Component | Component Percent | Component Registry Number |
|---|---|---|
| Sn | 74 | 7440-31-5 |
| Ti | 26 | 7440-32-6 |

IC ICM H01M004-38
ICS B22D011-06; H01M004-02; H01M010-40; C22C030-04
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56
ST silicon tin alloy **battery anode** rapid cooling; **lithium battery anode** silicon tin alloy; acid treatment oxide removal alloy **battery anode**
IT Secondary **batteries**
(**lithium**; manuf. of silicon-tin-based alloy for **nonaq.** electrolyte secondary **battery anode** by rapid cooling)
IT **Battery anodes**
Cooling
Pickling

(manuf. of silicon-tin-based alloy for **nonaq**. electrolyte secondary **battery anode** by rapid cooling)

IT 12013-56-8, CaSi2 **12014-85-6**, Cerium silicide (CeSi2) 12017-12-8, Cobalt silicide (CoSi2) 12018-09-6, Chromium silicide (CrSi2) 12022-99-0, Iron silicide (FeSi2) 12035-57-3, NiSi **12039-83-7**, Titanium silicide (TiSi2) 12039-87-1, Vanadium silicide (VSi2) 12039-88-2, Tungsten silicide (WSi2) **12066-83-0**, Praseodymium silicide (PrSi2) **12137-04-1**, Neodymium silicide (NdSi2) **12166-63-1** 12201-89-7, Nickel silicide (NiSi2) 12293-65-1, Manganese silicide (Mn4Si7) 53095-77-5, Magnesium silicide (MgSi2) 117615-38-0, Copper silicide (CuSi2)
(**anode** alloy contg.; manuf. of silicon-tin-based alloy for **nonaq**. electrolyte secondary **battery anode** by rapid cooling)

IT 113320-53-9 186143-06-6 253344-64-8 361445-59-2 361445-60-5 361445-61-6 361445-62-7 361445-63-8 361445-64-9 361445-65-0 361445-66-1 361445-67-2 361445-68-3 361445-69-4 361445-70-7 361445-71-8 **361445-72-9** 361445-80-9 361445-81-0 361445-82-1 361445-83-2 361445-84-3
(manuf. of silicon-tin-based alloy for **nonaq**. electrolyte secondary **battery anode** by rapid cooling)

IT 7647-01-0, Hydrochloric acid, uses 138906-19-1, Hydrofluoric acid mixt. with nitric acid
(picking soln.; manuf. of silicon-tin-based alloy for **nonaq**. electrolyte secondary **battery anode** by rapid cooling)

L48 ANSWER 7 OF 14 HCAPLUS COPYRIGHT 2003 ACS
2001:676379 Document No. 135:213506 **Nonaqueous** electrolyte secondary **battery**. Bito, Yasuhiko; Sato, Toshitada; Nitta, Yoshiaki (Matsushita Electric Industrial Co., Ltd., Japan). Eur. Pat. Appl. EP 1132984 A2 20010912, 12 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO. (English). CODEN: EPXXDW. APPLICATION: EP 2001-105297 20010305. PRIORITY: JP 2000-61123 20000306.

AB The present invention provides a rechargeable **neg**. **electrode** for a **nonaq**. electrolyte secondary **battery** comprising an alloy material which absorbs **lithium** during charge and desorbs **lithium** during discharge, and having a long cycle life. The **neg**. **electrode** includes an alloy having a hexagonal closest packing structure and a Ni2In type structure composed of at least two elements. The alloy may comprise an intermetallic compd. contg. at least one element selected from the group consisting of Sn, Si, and In, or at least one intermetallic compd. selected from the group consisting of Ti2Sn, NiCoSn, Mn2Sn, Ni3Sn2, BeSiZr, Co3Sn2, Cu2In, Ni2In, Ni2Si, Pd3Sn2 and Rh3Sn2.

IT **12510-35-9**, SnTi2
(**nonaq**. electrolyte secondary **battery**)

RN 12510-35-9 HCAPLUS
CN Tin, compd. with titanium (1:2) (8CI, 9CI) (CA INDEX NAME)

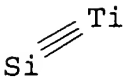
| Component | Ratio | Component Registry Number |
|---|---|---|
| Ti | 2 | 7440-32-6 |
| Sn | 1 | 7440-31-5 |

IC ICM H01M004-38
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56
ST **battery** secondary **nonaq** electrolyte;
**anode** intermetallic compd **battery**
IT **Battery anodes**
Mechanical alloying
Secondary **batteries**
(**nonaq**. electrolyte secondary **battery**)
IT Intermetallic compounds
(**nonaq**. electrolyte secondary **battery**)
IT Carbon black, uses
(**nonaq**. electrolyte secondary **battery**)
IT Atomizing (spraying)
(pneumatic; **nonaq**. electrolyte secondary **battery**)
IT Quenching (cooling)
(roll; **nonaq**. electrolyte secondary **battery**)
IT 9002-88-4, Polyethylene
(binder; **nonaq**. electrolyte secondary **battery**)
IT 96-49-1, Ethylene carbonate 110-71-4 7791-03-9, **Lithium** perchlorate 9003-07-0, Polypropylene 12019-41-9 12030-09-0 12059-24-4 12339-84-3 12504-35-7 **12510-35-9**, SnTi2 12526-67-9 60874-66-0 86116-27-0, Conisn 130811-82-4, Cobalt **lithium** manganese oxide Co0.2LiMn1.8O4 357417-81-3, Beryllium zirconium silicide
(**nonaq**. electrolyte secondary **battery**)
IT 7782-42-5, Graphite, uses
(**nonaq**. electrolyte secondary **battery**)

L48 ANSWER 8 OF 14 HCAPLUS COPYRIGHT 2003 ACS
2001:31783 Document No. 134:103240 Secondary **nonaqueous** electrolyte **batteries**. Sato, Toshitada; Takezawa, Hideharu; Bito, Yasuhiko; Matsuda, Hiromu; Toyoguchi, Yoshinori (Matsushita Electric Industrial Co., Ltd., Japan). PCT Int. Appl. WO 2001003210 A1 20010111, 22 pp. DESIGNATED STATES: W: CN, JP, KR, US; RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE. (Japanese). CODEN: PIXXD2. APPLICATION: WO 2000-JP4283 20000628. PRIORITY: JP 1999-188133 19990701.
AB The **batteries** use solid solns. LixMyM' (M = Ti, Zr, Mn, Co, Ni, Cu, and/or Fe; M' = Si and/or Sn; x <10; 0.1 .ltoreq.y .ltoreq.10) as **anode** active mass.

IT **12039-70-2**, Titanium silicide (TiSi) **12039-71-3**, Titanium silicide (Ti3Si) **12138-26-0**, Zirconium silicide (ZrSi) **12138-32-8** **12166-59-5**, SnTi3 **12211-03-9**, Zirconium silicide (Zr2Si) **12510-35-9**, SnTi2 **77137-25-8**, Titanium silicide (Ti2Si) **210885-32-8** **318515-48-9**
(metal solid solns. for **anodes** in secondary **lithium batteries**)

RN 12039-70-2 HCAPLUS
CN Titanium silicide (TiSi) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



RN 12039-71-3 HCAPLUS
CN Titanium silicide (Ti3Si) (7CI, 8CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Ti | 3 | 7440-32-6 |
| Si | 1 | 7440-21-3 |

RN 12138-26-0 HCAPLUS
CN Zirconium silicide (ZrSi) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

RN 12138-32-8 HCAPLUS
CN Tin, compd. with zirconium (1:1) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Zr | 1 | 7440-67-7 |
| Sn | 1 | 7440-31-5 |

RN 12166-59-5 HCAPLUS
CN Tin, compd. with titanium (1:3) (8CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Ti | 3 | 7440-32-6 |
| Sn | 1 | 7440-31-5 |

RN 12211-03-9 HCAPLUS
CN Zirconium silicide (Zr2Si) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Zr | 2 | 7440-67-7 |
| Si | 1 | 7440-21-3 |

RN 12510-35-9 HCAPLUS
CN Tin, compd. with titanium (1:2) (8CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Ti | 2 | 7440-32-6 |
| Sn | 1 | 7440-31-5 |

RN 77137-25-8 HCAPLUS
CN Titanium silicide (Ti2Si) (7CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Ti | 2 | 7440-32-6 |
| Si | 1 | 7440-21-3 |

RN 210885-32-8 HCAPLUS
CN Tin, compd. with titanium (1:1) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Ti | 1 | 7440-32-6 |
| Sn | 1 | 7440-31-5 |

RN 318515-48-9 HCAPLUS
CN Tin, compd. with zirconium (1:2) (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Zr | 2 | 7440-67-7 |
| Sn | 1 | 7440-31-5 |

IC ICM H01M004-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST secondary **lithium battery anode** solid soln; **lithium** transition metal solid soln **battery anode**; silicon solid soln **lithium battery anode**; tin solid soln **lithium battery**

**anode**

IT **Battery anodes**
(metal solid solns. for **anodes** in secondary **lithium batteries**)

IT 12017-11-7, Cobalt silicide (CoSi) 12019-61-3 12022-95-6, Iron silicide (FeSi) 12023-00-6 12023-01-7 12023-54-0, Iron silicide (Fe3Si) 12023-56-2 12032-85-8, Manganese silicide (MnSi) 12032-86-9, Manganese silicide (MnSi2) 12032-87-0 12033-06-6 12035-57-3, NiSi **12039-70-2**, Titanium silicide (TiSi) **12039-71-3**, Titanium silicide (Ti3Si) 12054-11-4, CuSn 12059-11-9 12059-14-2, Nickel silicide (Ni2Si) 12059-23-3 12134-03-1, Cobalt silicide (Co2Si) 12134-36-0, Copper silicide (Cu3Si) 12136-73-1, Manganese silicide (Mn2Si) **12138-26-0**, Zirconium silicide (ZrSi) **12138-32-8** 12163-59-6, Manganese silicide (Mn3Si) **12166-59-5**, SnTi3 12201-89-7, Nickel silicide (NiSi2) **12211-03-9**, Zirconium silicide (Zr2Si) 12297-65-3 12339-84-3 12343-95-2, Iron silicide (Fe2Si) 12410-47-8, Cobalt silicide (Co3Si) **12510-35-9**, SnTi2 12645-12-4, Copper silicide (CuSi) 12725-82-5 12763-92-7 52935-15-6 54723-87-4, Iron silicide (Fe5Si2) 55071-50-6 63780-97-2 75349-09-6 **77137-25-8**, Titanium silicide (Ti2Si) 162783-54-2, Copper silicide (Cu2Si) **210885-32-8 318515-48-9** 318515-49-0, Iron silicide (Fe2.3Si)
(metal solid solns. for **anodes** in secondary **lithium batteries**)

L48 ANSWER 9 OF 14 HCAPLUS COPYRIGHT 2003 ACS

2000:741125 Document No. 133:284183 Material for **nonaqueous** electrolyte **battery anode** composed of mixture of non-carbon and carbon materials. Yamada, Shinichiro; Endo, Takuya; Imoto, Hiroshi; Li, Guohua; Tanizaki, Hiroaki (Sony Corp., Japan). Eur. Pat. Appl. EP 1045465 A2 20001018, 13 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO. (English). CODEN: EPXXDW. APPLICATION: EP 2000-108189 20000413. PRIORITY: JP 1999-107158 19990414; JP 1999-365066 19991222; JP 1999-365065 19991222.

AB A material for an **anode** (capable of preventing change in the vol. of an active material occurring when **lithium** is doped/dedoped to improve resistance against cycle operations) contains a mixt. of a non-carbon material and a carbon material, wherein when an assumption is made that the av. particle size of the non-carbon material is RM and the av. particle size of the carbon material is RC, the ratio RM/RC is not higher than one, and when an assumption is made that the wt. of the non-carbon material is WM and the wt. of the carbon is WC, the ratio WM/WC is not higher than one or a mixt. of a silicon compd. and a carbon material, wherein when an assumption is made that the av. particle size of the silicon compd. is RSi and the av. particle size of the carbon material is RC, the ratio RSi/RC is not higher than one.

IT **12738-91-9**, Titanium silicide **144593-17-9**, Cerium silicide

(material for **nonaq**. electrolyte **battery** **anode** composed of mixt. of non-carbon and carbon materials)

RN 12738-91-9 HCAPLUS
CN Titanium silicide (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Ti | x | 7440-32-6 |
| Si | x | 7440-21-3 |

RN 144593-17-9 HCAPLUS
CN Cerium silicide (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| Ce | x | 7440-45-1 |
| Si | x | 7440-21-3 |

IC ICM H01M004-58
ICS C01B031-00
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST **battery** **anode** noncarbon carbon material mixt; **lithium** **battery** **anode** noncarbon carbon material mixt
IT **Battery** **anodes**
Petroleum pitch
(material for **nonaq**. electrolyte **battery** **anode** composed of mixt. of non-carbon and carbon materials)
IT Fluoropolymers, uses
(material for **nonaq**. electrolyte **battery** **anode** composed of mixt. of non-carbon and carbon materials)
IT 105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate 409-21-2, Carbon silicide, uses 7429-90-5, Aluminum, uses 7440-74-6, Indium, uses 7631-86-9D, Silicon oxide, "nonstoichiometric" 7782-42-5, Graphite, uses 9003-07-0, Polypropylene 11104-62-4, Cobalt silicide 11104-85-1, Molybdenum silicide 11113-78-3, Palladium silicide 11129-97-8, Rhodium silicide 12033-89-5, Silicon nitride, uses 12190-79-3, Cobalt **lithium** oxide colio2 12626-44-7, Chromium silicide 12626-76-5, Iron silicide 12626-89-0, Manganese silicide 12643-20-8, Copper silicide 12737-18-7, Calcium silicide **12738-91-9**, Titanium silicide 21324-40-3, **Lithium** hexafluorophosphate 22831-39-6, Magnesium silicide (Mg2Si) 37299-94-8, Boron silicide 39404-03-0, Magnesium silicide 39409-76-2, Sodium silicide 39467-10-2, Nickel silicide 50927-81-6, Silicon sulfide 52037-56-6, Vanadium silicide 52953-72-7, Tantalum silicide 60866-77-5, Silicon phosphide

66103-40-0, Potassium silicide 68247-39-2, Indium silicide
82392-07-2, Rubidium silicide 102427-06-5, Yttrium silicide
103289-29-8, Tin silicide 106698-75-3, Aluminum silicide
128579-24-8, Zinc silicide 143181-11-7, Barium silicide
**144593-17-9**, Cerium silicide 215917-55-8, Cesium silicide
(material for **nonaq**. electrolyte **battery anode** composed of mixt. of non-carbon and carbon materials)

IT 24937-79-9, Pvdf
(material for **nonaq**. electrolyte **battery anode** composed of mixt. of non-carbon and carbon materials)

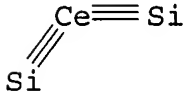
IT 7440-44-0, Carbon, uses
(nongraphitizable and graphitizable; material for **nonaq** . electrolyte **battery anode** composed of mixt. of non-carbon and carbon materials)

L48 ANSWER 10 OF 14 HCAPLUS COPYRIGHT 2003 ACS
2000:176060 Document No. 132:196774 **Anode** materials for secondary **nonaqueous** electrolyte **batteries** and their manufacture. Kaminaka, Hideya; Abe, Masaru; Negi, Noriyuki; Nitta, Yoshiaki; Shimamura, Harunari; Okamura, Kazuhiro (Sumitomo Metal Industries, Ltd., Japan; Matsushita Electric Industrial Co., Ltd.). PCT Int. Appl. WO 2000014817 A1 20000316, 47 pp. DESIGNATED STATES: W: CN, KR, US; RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE. (Japanese). CODEN: PIXXD2. APPLICATION: WO 1999-JP4775 19990903. PRIORITY: JP 1998-253981 19980908.

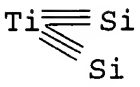
AB The **anode** materials are alloy particles having av. diam. 0.1-50 .mu.m and contg. 5-99% Si phase grains, which are at least partially covered with a Si contg. solid soln. or an intermetallic compd. phase. The **anode** materials are prepd. by cooling an alloy melt at .gtoreq.100.degree./s; or by coating materials, contg. elements capable of forming solid soln. or intermetallic compd with Si, on Si or Si phase contg. alloy particles and heating the coated particles at a temp. below T+10.degree., where T is the solidus temp. of the solid soln. or intermetallic compd.

IT **12014-85-6**, Cerium silicide (CeSi2) **12039-83-7**, Titanium silicide (TiSi2) **12066-83-0**, Praseodymium silicide (PrSi2) **12137-04-1**, Neodymium silicide (NdSi2)
(silicon alloys contg. intermetallic compd. covered silicon grains for secondary **lithium battery anodes**)

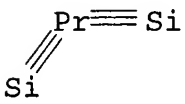
RN 12014-85-6 HCAPLUS
CN Cerium silicide (CeSi2) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



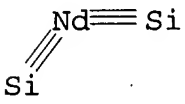
RN 12039-83-7 HCAPLUS
CN Titanium silicide (TiSi2) (6CI, 8CI, 9CI) (CA INDEX NAME)



RN 12066-83-0 HCAPLUS
CN Praseodymium silicide (PrSi2) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



RN 12137-04-1 HCAPLUS
CN Neodymium silicide (NdSi2) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



IT **72073-64-4P 223516-45-8P 259750-78-2P**
**259750-79-3P**
(silicon alloys contg. silicon solid soln. or intermetallic compd. covered silicon grains for secondary **lithium battery anodes**)
RN 72073-64-4 HCAPLUS
CN Silicon alloy, base, Si 77,Ti 23 (9CI) (CA INDEX NAME)

| Component | Component Percent | Component Registry Number |
|---|---|---|
| Si | 77 | 7440-21-3 |
| Ti | 23 | 7440-32-6 |

RN 223516-45-8 HCAPLUS
CN Silicon alloy, base, Si 52,Nd 48 (9CI) (CA INDEX NAME)

| Component | Component Percent | Component Registry Number |
|---|---|---|
| Si | 52 | 7440-21-3 |
| Nd | 48 | 7440-00-8 |

RN 259750-78-2 HCAPLUS
CN Silicon alloy, base, Si 52,Pr 48 (9CI) (CA INDEX NAME)

| Component | Component Percent | Component Registry Number |
|---|---|---|
| Si | 52 | 7440-21-3 |
| Pr | 48 | 7440-10-0 |

RN 259750-79-3 HCAPLUS
CN Silicon alloy, base, Si 60,Ce 40 (9CI) (CA INDEX NAME)

| Component | Component Percent | Component Registry Number |
|---|---|---|
| Si | 60 | 7440-21-3 |
| Ce | 40 | 7440-45-1 |

IC ICM H01M004-02
ICS H01M004-38; H01M010-40; B22F009-08; B22F009-10
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST **battery anode** silicon alloy structure manuf
IT **Battery anodes**
(silicon alloys contg. silicon solid soln. or intermetallic compd. covered silicon grains for secondary **lithium battery anodes**)
IT 12013-56-8, CaSi2 **12014-85-6**, Cerium silicide (CeSi2) 12017-12-8, Cobalt silicide (CoSi2) 12018-09-6, Chromium silicide (CrSi2) 12022-99-0, Iron silicide (FeSi2) **12039-83-7**, Titanium silicide (TiSi2) 12039-88-2, Tungsten silicide (WSi2) **12066-83-0**, Praseodymium silicide (PrSi2) **12137-04-1**, Neodymium silicide (NdSi2) 12201-89-7, Nickel silicide (NiSi2) 12293-65-1, Manganese silicide (Mn4Si7) 53095-77-5, Magnesium silicide (MgSi2) 117615-38-0, Copper silicide (CuSi2)
(silicon alloys contg. intermetallic compd. covered silicon grains for secondary **lithium battery anodes**)
IT 11099-22-2 69255-78-3
(silicon alloys contg. silicon solid soln. covered silicon grains for secondary **lithium battery anodes**)
IT **72073-64-4P** 94984-43-7P 117937-72-1P 126500-58-1P 126500-60-5P 152142-58-0P 169217-08-7P 195060-07-2P **223516-45-8P** 259750-69-1P 259750-70-4P 259750-71-5P 259750-72-6P 259750-73-7P 259750-74-8P 259750-75-9P 259750-76-0P 259750-77-1P **259750-78-2P** **259750-79-3P** 259750-80-6P
(silicon alloys contg. silicon solid soln. or intermetallic compd. covered silicon grains for secondary **lithium battery anodes**)

L48 ANSWER 11 OF 14 HCAPLUS COPYRIGHT 2003 ACS
1999:32326 Document No. 130:141692 **Nonaqueous** electrolyte **batteries** using silicon alloy **anodes**. Inamasu,

Tokuo (Yuasa Battery Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 11007979 A2 19990112 Heisei, 9 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1997-159078 19970617.

AB The title **batteries** use **anodes** contg. Si alloys SiMx (M = .gtoreq.1 of alloying elements; x >0) and electrolytes contg. C-contg. salts. The **batteries** have high energy d., long cycle life, and safety.

IT **116276-95-0**, Silicon 50, titanium 50 (atomic)
(**anodes**; **nonaq. batteries** with silicon alloys and C-contg. electrolyte salts)

RN 116276-95-0 HCAPLUS

CN Titanium alloy, base, Ti 63,Si 37 (9CI) (CA INDEX NAME)

| Component | Component Percent | Component Registry Number |
|---|---|---|
| Ti | 63 | 7440-32-6 |
| Si | 37 | 7440-21-3 |

IC ICM H01M010-40
ICS H01M010-40; H01M004-02; H01M004-38

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST silicon alloy **anode lithium battery** safety; fluorocarbon salt **nonaq** electrolyte **battery**

IT **Battery anodes**
**Battery** electrolytes
Safety
(**nonaq. batteries** with silicon alloy **anodes** and C-contg. electrolyte salts)

IT 11135-64-1, Iron 50, silicon 50 (atomic) 12007-50-0, Boron silicide (B3Si) 12042-55-6, Aluminum silicide (AlSi) 12137-64-3, Silicon phosphide (SiP) 12255-38-8, Silicon arsenide (SiAs) 37352-26-4 54741-77-4 58847-28-2, Silicon 25, vanadium 75 (atomic) 71894-70-7, Nickel 66.7, silicon 33.3 (atomic) 100502-97-4, Calcium 50, silicon 50 (atomic) 101180-12-5, Silicon 50, tungsten 50 (atomic) 107312-84-5, Platinum 50, silicon 50 (atomic) **116276-95-0**, Silicon 50, titanium 50 (atomic) 149145-58-4, **Lithium** 63.2, silicon 36.8 (atomic) 152003-65-1, Cobalt 50, silicon 50 (atomic)
(**anodes**; **nonaq. batteries** with silicon alloys and C-contg. electrolyte salts)

IT 90076-65-6, **Lithium** bis(trifluoromethylsulfonyl)amide 132843-44-8
(electrolytes; **nonaq. batteries** with silicon alloy **anodes** and C-contg. salts)

L48 ANSWER 12 OF 14 HCAPLUS COPYRIGHT 2003 ACS

1993:258075 Document No. 118:258075 Secondary **nonaqueous** -electrolyte **batteries** with improved aluminum-**lithium anodes**. Sato, Keiji (Seiko Instruments, Inc., Japan). Jpn. Kokai Tokkyo Koho JP 04206262 A2 19920728

Heisei, 4 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1990-339859 19901129.

AB The **batteries** use **anodes** prepd. by alloying Al alloys having Vicker's hardness .ltoreq.60 with **Li**. Preferably, the Al alloys contain Mn, Cr, Zr, V, Mo, and/or W and are annealed after processing. Cylindrical **batteries** using these **anodes** have long cycle life.

IT **12780-87-9**
(**anodes** from annealed, **lithium**-aluminum, for controlled hardness, in **batteries**)

RN 12780-87-9 HCAPLUS

CN Aluminum alloy, base, Al 100,Zr 0.5 (9CI) (CA INDEX NAME)

| Component | Component Percent | Component Registry Number |
|---|---|---|
| Al | 100 | 7429-90-5 |
| Zr | 0.5 | 7440-67-7 |

IC ICM H01M004-02
ICS H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST aluminum **lithium** alloy **battery anode**

IT **Anodes**
(**battery**, aluminum-**lithium**, aluminum alloys for manuf. of, controlled hardness of)

IT 7440-33-7, Tungsten, uses 7440-62-2, Vanadium, uses 7440-67-7, Zirconium, uses
(aluminum alloys contg., **lithium**-aluminum **anodes** from annealed, for hardness control, in secondary **batteries**)

IT 11114-64-0 12625-60-4 12719-56-1 **12780-87-9** 105303-33-1 147952-77-0
(**anodes** from annealed, **lithium**-aluminum, for controlled hardness, in **batteries**)

IT 12798-95-7P
(**anodes**, manuf. of, for secondary **batteries**)

L48 ANSWER 13 OF 14 HCAPLUS COPYRIGHT 2003 ACS

1989:461036 Document No. 111:61036 Secondary **nonaqueous batteries** with **lithium**-insertable **anodes**. Nakane, Yasuro; Watanabe, Hiroshi; Saito, Toshihiko; Furukawa, Sanehiro (Sanyo Electric Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 01076669 A2 19890322 Heisei, 7 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1987-233358 19870917.

AB Al or Al alloys annealed under different conditions are alloyed with **Li** for use as alkali metal-insertable **anodes** for the title **batteries**. These **anode** materials have low stress and do not readily crack in repeated charge-discharge cycles and provide long lifetime of the **batteries**.

IT **12780-87-9**
(annealed, **anodes** from, **lithium**-insertable,

for secondary **batteries**)
RN 12780-87-9 HCAPLUS
CN Aluminum alloy, base, Al 100,Zr 0.5 (9CI) (CA INDEX NAME)

| Component | Component Percent | Component Registry Number |
|---|---|---|
| Al | 100 | 7429-90-5 |
| Zr | 0.5 | 7440-67-7 |

IC ICM H01M004-46
ICS H01M004-02
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST **anode battery lithium** aluminum alloy;
annealing aluminum **lithium** insertable **anode**
IT Annealing
(of aluminum and aluminum alloys, for **lithium**
-insertable **anodes** in **batteries**)
IT **Anodes**
(**battery**, **lithium**-insertable, aluminum or
aluminum alloy for, annealing of)
IT 7429-90-5, Aluminum, uses and miscellaneous 11114-64-0
12625-94-4 12686-71-4 12780-46-0 **12780-87-9**
(annealed, **anodes** from, **lithium**-insertable,
for secondary **batteries**)
IT 7439-93-2, **Lithium**, uses and miscellaneous
(**anodes**, aluminum or aluminum alloy for, annealing of,
for **batteries**)

L48 ANSWER 14 OF 14 HCAPLUS COPYRIGHT 2003 ACS
1989:176707 Document No. 110:176707 Secondary **nonaqueous**
**batteries**. Watanabe, Hiroshi; Nakane, Ikuro; Saito,
Toshihiko; Furukawa, Sanehiro (Sanyo Electric Co., Ltd., Japan).
Jpn. Kokai Tokkyo Koho JP 63285865 A2 19881122 Showa, 3 pp.
(Japanese). CODEN: JKXXAF. APPLICATION: JP 1987-120801 19870518.
AB The title **batteries** have **Li**-inserting prepd.
from Al alloys contg. Si, Mn, Cu, and/or Zr. Thus, a Al-1% Cu plate
was electrolytically inserted with **Li** from a 1M
LiClO4/propylene carbonate-MeOC2H4OMe electrolyte, and used an
**anode** in a MnO2 **battery** using the same
electrolyte. This **anode** had tensile strength 28 Kg/mm2
and Vickers hardness 106, vs. 17 Kg/mm2 and 50 for an **anode**
prepd. from Al plate.
IT **12707-19-6 39451-37-1 107288-04-0**
(**anodes**, **lithium**-inserting, for secondary
**nonaq. batteries**)
RN 12707-19-6 HCAPLUS
CN Aluminum alloy, base, Al 95,Zr 5 (9CI) (CA INDEX NAME)

| Component | Component Percent | Component Registry Number |
|---|---|---|

| | | |
|---|---|---|
| Al | 95 | 7429-90-5 |
| Zr | 5 | 7440-67-7 |

RN 39451-37-1 HCAPLUS
CN Aluminum alloy, base, Al 99,Zr 1 (9CI) (CA INDEX NAME)

| Component | Component Percent | Component Registry Number |
|---|---|---|
| Al | 99 | 7429-90-5 |
| Zr | 1 | 7440-67-7 |

RN 107288-04-0 HCAPLUS
CN Aluminum alloy, base, Al 97,Zr 3 (9CI) (CA INDEX NAME)

| Component | Component Percent | Component Registry Number |
|---|---|---|
| Al | 97 | 7429-90-5 |
| Zr | 3 | 7440-67-7 |

IC ICM H01M004-02
ICS H01M004-64; H01M004-66; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST **anode nonaq battery** aluminum alloy
IT **Anodes**
(**battery**, **lithium**-inserting, aluminum alloys for)
IT 7439-93-2, **Lithium**, uses and miscellaneous
(**anodes**, aluminum alloys for, in secondary **batteries**)
IT 11109-11-8 11114-64-0 11122-18-2 11145-30-5 11146-04-6
11149-80-7 12609-50-6 12625-94-4 **12707-19-6**
**39451-37-1** 57622-21-6 **107288-04-0**
(**anodes**, **lithium**-inserting, for secondary **nonaq. batteries**)